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EXPRESS HEALTHCARE

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Ameera Shah, Managing Director, Metropolis Healthcare

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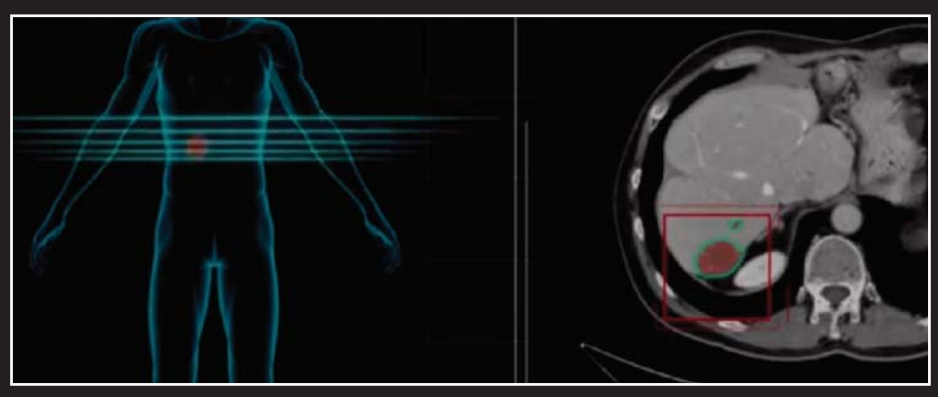

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EXPRESS HEALTHCARE

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+ Market

Ameera Shah
Managing Director,
Metropolis Healthcare

A TOOL TO CREATE VALUE FOR ALL

Can the rise of FinTech be a gamechanger for the healthcare sector?

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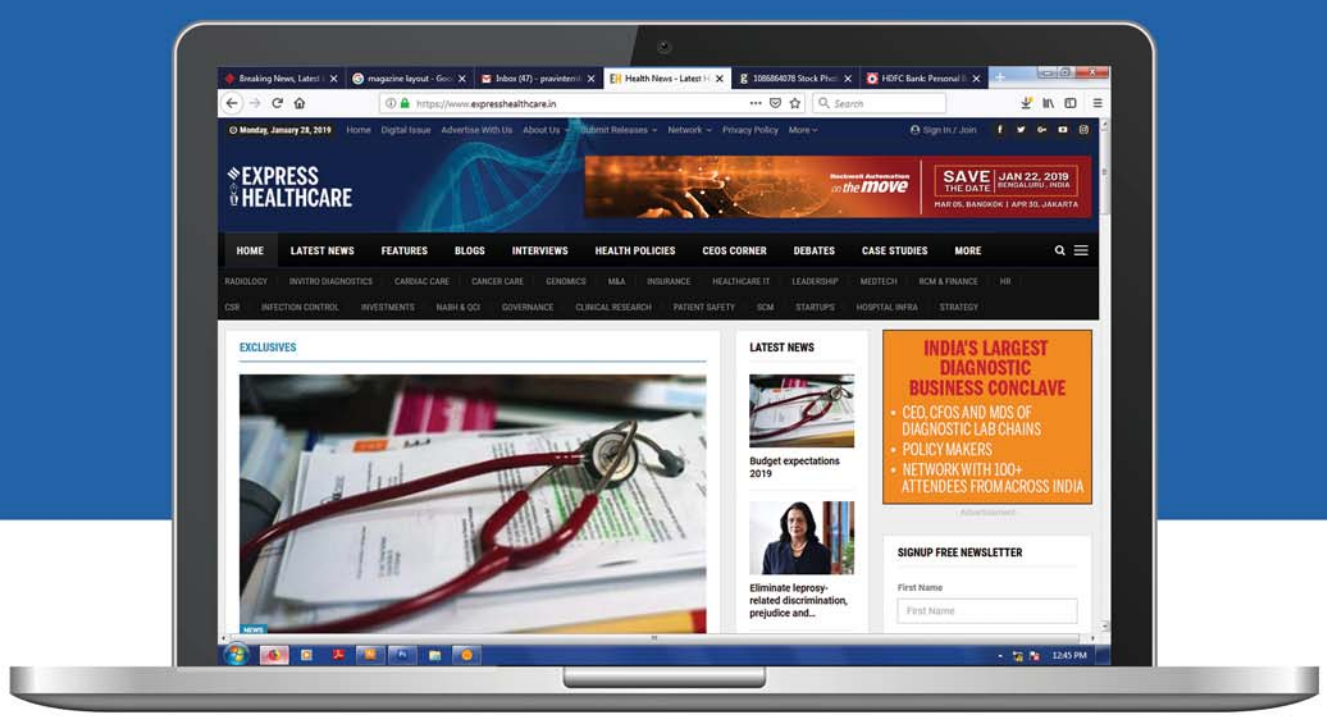

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PM Modi has a tough act to follow: his own!

Prime Minister Modi's second term, with a single party majority, is a once in a lifetime opportunity for him to reshape the country's place in history. Ironically, he has a tough act to follow: his own! Will he be able to exceed to his own performance in the first term?

Some experts from the sector have already shared their expectations from National Democratic Alliance (NDA) government's second term *(See Express Healthcare story: Safeguarding India's health: https://bit.ly/2Mds9F1)*

According to media reports, the government is planning a cut of over 65 per cent in max retail prices of stents, knee implants.

Key challenges that have been highlighted that need to be tackled are issues with quality of medicines and devices made in India, high treatment costs, 'irrational' and 'unsafe' combination drugs and dependence on China for key ingredients to make medicines.

The road ahead and action plan is to cap retailer margins, regulate medical devices, scrutinise combination drugs approved and promote domestic manufacturing of key medicine ingredients.

Expectations stand tall. Ayushman Bharat (AB), dubbed Modicare, PM Modi's signature scheme to provide insurance backed secondary and tertiary healthcare to the economically weaker sections of society was another masterstroke. If PM Modi can increase the allocation for healthcare in the budget to the target of 2.5 per cent of GDP, this vision can be expanded to include primary healthcare and prevention. In time, as the sphere of prevention spreads, AB will be less burdened and more effective. Given the massive mandate, at least some of the states which rejected AB might have a re-think and now come on board as well. 'Modicare' can thus be the NDA/PM Modi's most lasting legacy to India.

Not too many private hospitals signed up for AB, as they were unhappy with the reimbursement packages being offered under the scheme. Most were in a wait-and-watch mode as there was always the possibility that a non-BJP/Modi government, or even a non-majority BJP/Modi one, would be forced to repeal AB, in the same way that US President Trump repealed Obamacare/ Affordable Care Act. Now that AB is here to stay, will we see more participation from private hospitals? Or will the government moderate their stance, heeding the advice of Dr Prathap Reddy, Chairman, Apollo Hospitals Group to have "a prudent approach to pricing and reimbursements to encourage widespread adoption"?

Analysts are predicting increased consolidation in India's hospital sector as entities struggle for sustainability. ICRA reported a 155 per cent increase in the total value of M&A transactions in the sector, with FY2019 clocking Rs 7615 crore, as against Rs 2991 crore in FY2018, the highest value of hospital M&As in over five years. Consolidation brings economies of scale but will these be passed on to patients? Also, the flip side of consolidation is the creation of monopolies, which reduce choices for patients.

He will have to balance industry interests with patient well-being. The first needs to be coaxed to invest in India and cement his pro-industry creds. The second needs to be appeased because it's the source of his groundswell of votes

So while PM Modi's mandate may be massive, it comes with its own burden to live up to his pre poll promises. He will have to balance industry interests with patient well-being. The first needs to be coaxed to invest in India and cement his pro-industry creds. The second needs to be appeased because it's the source of his groundswell of votes.

PM Modi has cultivated an image of being pro-industry right from his days as chief minister of Gujarat. Besides strengthening local industry with moves like the indigenisation of medical devices, India also needs further investments by private healthcare, be they hospitals or med tech players. This will bring the latest medicines/medical devices to India as well as create jobs, a major poll promise.

But these investors have to be first convinced that India has a large market which can afford cutting edge medicines or medical devices to make their business model viable. With a section of India living below the poverty line, healthcare spends remain low. Investors have remained ambivalent about further investments. Thus, the government's populist measures like price and trade margin rationalisation will need to be accompanied by sufficient market expansion initiatives to incentivise the corporate sector to invest.

Vital reforms of the healthcare sector, required to meet our commitment to universal healthcare coverage by 2030, have been kept on the back burner for too long. The National Medical Commission Bill, 2017 was introduced in Lok Sabha (LS) way back in December 2017 but has seen no movement since then. The National Commissions for Homeopathy Bill 2019 the National Commission for Indian system of Medicine Bill 2019, both introduced in Rajya Sabha (RS) this January, are pending. The Allied and Healthcare Professionals Bill 2018 was introduced last December in the RS and is also awaiting further action. At this point, PM Modi can do no wrong and can therefore take tough decisions. But will he?

VIVEKA ROYCHOWDHURY *Editor*
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INTERVIEW

‘Listing of equity shares will enhance our visibility and brand image’

Ameera Shah, Managing Director, Metropolis Healthcare, reveals more about the company’s plan post IPO, in an interaction with **Sanjiv Das**

Metropolis was listed at 9 per cent premium at the issue price. What does it mean for the company?
The listing post IPO at a premium is a testimony to our competitive strengths and attractive financial profile.

Our key competitive strengths include (i) Being one of the leading diagnostics companies in India well positioned to leverage the expected industry growth; (ii) Widespread operational network, young patient touch point network and asset-light growth of service network; (iii) Comprehensive test menu with wide range of clinical laboratory tests and profiles; (iv) Strong and established brand with focus on quality and customer service; (v) Robust information technology structure with focus on improving efficiency; (vi) Established track record of successful acquisition and integration in India and overseas; and (vii) Experienced senior management team and qualified operational personnel.

How is the IPO going to benefit Metropolis ?
The objects of the IPO offer are to achieve the benefits of listing

the equity shares on the stock exchanges and for the offer for sale. Further, our company expects that listing of the equity shares will enhance our visibility and brand image and provide liquidity to our shareholders. The listing provides a public market for the equity shares in India.

It will also help us pursue the key elements of our business strategy as follows:
- Continue to focus on organic growth initiatives to expand our reach
- Continue our focus on providing quality tests and services
- Focus on the expansion of our service network
- Focus on increasing our business from individual patients
- Pursue new avenues of growth
- Focus on consolidation opportunities in a largely unorganised diagnostic sector.

Are you anticipating any risk factors associated with the IPO?
Some of the key risk factors which are more relevant, are
- Highly-competitive and fragmented industry
- Limitation of trained human resource availability
- Vulnerability to technological advancements
- Challenge in entering new geographies
- Capability to launch new tests
- Pricing pressures
- Capability to optimise operational expenditures
- Government policies: Lack of a comprehensive and stringent regulatory framework.

What will be your strategy for growth from here on?
We will continue to focus on organic growth initiatives to expand our reach. We have developed a highly differentiated and focussed growth strategy of dividing the key target cities in which we operate into Focus Cities, Seeding Cities and Other Key Cities, on the basis of our market share, the strength of our brand, operational history, experience and the quality of our team. We channel resource in being the dominant player in these cities.

We have identified five focus cities, for the financial year 2019 — Mumbai, Bengaluru, Chennai, Surat and Pune.

We intend to deepen our penetration in Focus Cities by (i) Increasing the number of Third Party PSCs;
(ii) Enhancing our laboratory capacity and test menu by adding latest machines and technology;
(iii) Expanding business derived from individual patients;
(iv) Employing focussed sales and marketing teams to generate walk-ins through targeted marketing strategies and use of the customer relationship management (CRM) marketing tool;
(v) Doctor engagement through medical awareness initiatives and meetings with medical practitioners; and (vi) Increased focus on home collection service and wellness offerings. We intend to evaluate the list of Focus Cities on a yearly basis to ensure that our resources are deployed in line with our growth strategy.

We have identified eight Seeding Cities and regions which are expected to have strong growth potential, comprising Rajkot, Nashik, Nagpur, Kochi, Raipur, National Capital Region (NCR), Kolkata and Guwahati (Seeding Cities).

We intend to expand our network in Seeding Cities by (i) Increasing the number of patient touch points;
(ii) Expanding our test offerings; and
(iii) Employing targeted marketing strategies to grow our business.

We intend to convert some of these Seeding Cities into Focus Cities, in a phased manner, after these cities meet our internal benchmarks.

We have identified 166 other key cities (Other Key Cities) in which we either have our satellite or express laboratories or ARCs. In our view, some of these Other Key Cities have the potential of becoming Seeding Cities in the medium term.

We will also continue our focus on providing quality tests and services. The quality and reliability of our tests and services are critical to our success. Our vision is to help

doctors treat their patients better and our strategy is to take the following steps in this regard:
- Upgrading our technology for better quality, efficiency and reliability;
- Consistent value addition to tests being offered; and
- Promoting disease and disorder specific profiles, to allow doctors to receive comprehensive view of the patient's disease status.

We are also actively involved in campaigns focussed on creating awareness of particular conditions such as cancer, lifestyle diseases, monsoon diseases, and the importance of periodic testing.

We are also focussing on the expansion of our service network. Going forward, we are particularly focussed on using the Third Party PSC model for expanding the geographical reach of our service network, due to its high scalability and limited capital expenditure involved. We also intend to grow our Owned PSCs in Focus and Seeding Cities. We expect that a wider geographic reach will expand our customer base as well as improve our profitability by allowing us to better leverage our infrastructure. We will also continue to seek strategic partnerships with key third-party patient service centres in India, Africa and the Middle East to expand our geographic reach. Our focus is also to increase our business from individual patients.

We intend to pursue several new avenues of growth, including: growing our offering of test packages; pursuing scientific upselling of tests: participating in select public-private partnership tenders; increase focus on contract research.

What are your expansion plans for the Indian and global markets?
I would like to reiterate that growth in the Indian market will be our single most priority in the next three years. Let me touch upon markets outside India. Our revenue from operations outside India was Rs 400.10 million and Rs 520.72 million, which accounted for 7.15 per cent and 8.09 per cent of our revenue from operations for the nine months period ended December 31, 2018 and financial year 2018, respectively. Outside India, we have laboratory operations in Ghana, Kenya, Zambia, Mauritius and Sri Lanka. In addition, we have also entered into agreements with third parties for collection and processing of specimens in Nepal, Nigeria, the UAE and Oman. As of December 31, 2018, we have an operational network of 10 clinical laboratories, 26 patient touch points and seven ARCs, outside India.

Outside India, as of December 31, 2018, our laboratory network consists of : (i) Four RRLs, located in Kenya, Zambia, Ghana and Sri Lanka;
(ii) One satellite laboratory in Ghana; and
(iii) Five express laboratories, out of which four are located in Kenya and one is located in Sri Lanka. In addition, we have also set-up a laboratory in Mauritius under the LIH model. We have also entered into agreements with third parties for collection and processing of specimens in Nepal, Nigeria, the UAE and Oman. As of December 31, 2018, we have a service network of 26 patient touch points and seven ARCs, outside India. The specimens that we receive from these countries are imported in compliance with the Indian Council of Medical Research guidelines for the import of test specimens.

We will also continue to seek strategic partnerships with key third-party patient service centres in India, Africa and the Middle East.

In comparison to your competitors, Metropolis is said to have better return ratio with return on net worth. How do you maintain this?
Our weighted average for Return on Net Worth for FY16 to FY18 was 27.41 per cent on consolidated basis and 29.11 per cent on standalone basis. We had attractive RoCE given our asset-light model - High ROCE of 64 per cent in FY18. Asset light: ~ 90 per cent of incremental Individual patients touchpoints added in last two years were third-party.
- Metropolis' young network and Individual patients transition will be a key driver of its revenue growth and margin expansion.
- 20.7 per cent Individual patients Revenue CAGR in Focus Cities
- Young Network: 75 per cent of the existing Individual patients touch points added during FY2016-18
- Average realisation of Rs 402/test and Rs 835/patient
- Consistent EBITDA margin of ~28 per cent over the last three years
- Higher test volumes is the key contributor to growth
- High proportion of specialised and semi-specialised tests leading to higher revenue per test / patient
- Higher test volume and test mix change through upselling and offering customised packages are the key drivers of growth
- The company has an established track record of successful acquisition and integration
- Bringing in industry practices
- Quality controls and standards
- Standardised machines and SOPs

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PRE EVENT

4th edition of Healthcare Senate to be held in New Delhi from July 11-12, 2019

The theme for the summit is 'India Healthcare Inc: Financially Fit, Tech Empowered'

THE 4TH edition of Healthcare Senate, India's largest private sector Healthcare Business Summit, will be held from July 11-12, 2019 at Radisson Blu Airport, New Delhi. Healthcare Senate 2019 invites CXOs of hospital chains, owners/promoters of hospitals, CEOs, CFOs, CIOs, COOs, supply chain heads, thought leaders, industry stalwarts and domain experts to congregate at India's largest private sector business summit to ideate new strategies, techniques and business models to ensure a steady transition of technology in various business processes to achieve financial sustainability.

The first three editions of Healthcare Senate served as an excellent platform for thought leaders, key decision makers, investors and budget holders to share and exchange strategies. The first edition focussed on 'Value-based healthcare delivery', the second edition highlighted 'Building a future ready healthcare sector for India' while the third edition focussed on 'Strengthening Values for Sustainable Growth'.

The fourth edition takes forward this theme, analysing strategies to make 'India Healthcare Inc: Financially Fit, Tech Empowered'.

This year's edition will examine the rapid advancements that technologies such as AI, cloud computing, block chain, IoT and more have ushered in healthcare by automating most of the complex business processes within healthcare organisations.

It will also drive home the point that we need to adopt strategies and approaches to derive real value by turning the initial support which healthcare businesses receive today through PE, VC, IPO funding etc., into long-term growth -- transforming a spark into a sustainable fire.

Thus, this year's Healthcare Senate will establish how financial stability and technological empowerment is pivotal for healthcare organisations to tackle key business endeavours like evolving healthcare product/service lines, expanding geographic footpints or investing in new areas that enhance patient care and experience.

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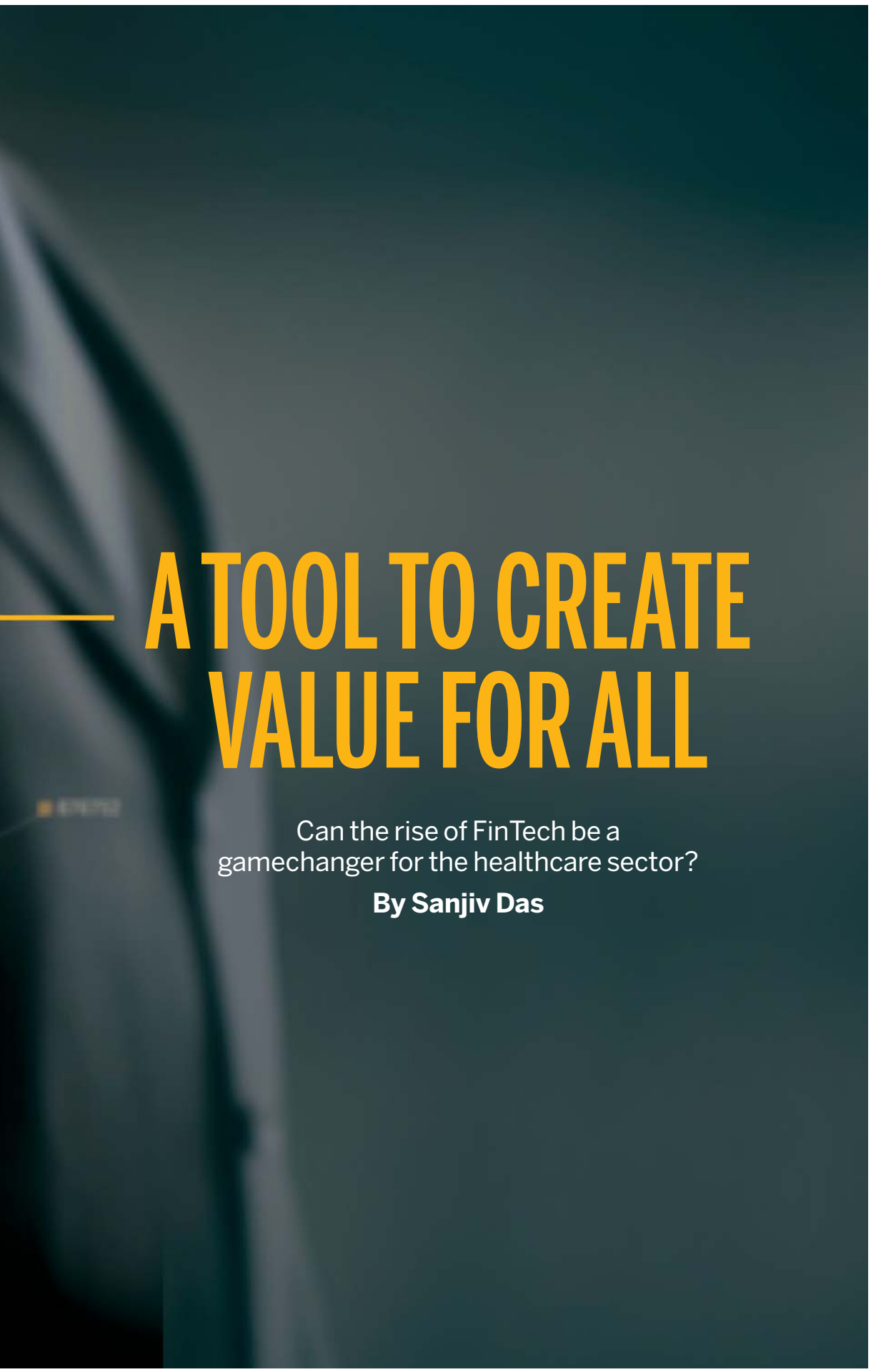

A TOOL TO CREATE VALUE FOR ALL

Can the rise of FinTech be a gamechanger for the healthcare sector?

By Sanjiv Das

With India witnessing a digitisation upsurge, Internet and rise of smartphone users with increasing digital transactions, one can seen a evolving FinTech ecosystem within the country. Moreover, financial services industry are undergoing a consumer-driven transition approach from legacy processes to on-demand accessibility to a variety of non-traditional payment options, banking and asset management options. These trends drive more demand for FinTech services in India.

FinTech is the buzzword in the banking sector and refers to the use of technology across all financial services functions. With FinTech, there has been a rise in traditional financial services and benefits to consumers. Initially deployed at the back-end systems within established financial institutions, banks are increasingly looking to use FinTech across its entire value chain in order to garner the benefits. These services have been able to redefine financial services. According to an E&Y report, the FinTech industry attracted over $13.1 billion in VC-backed investments in 2016.

After the banking sector having evolved to perform strategic and focussed role with the help of FinTech, the healthcare sector also got its share of benefits from fintech. Healthcare, a sector though diversified and full of opportunities, is facing the conundrum of how to deliver meaningful and positive experiences to its customers without raising costs. With out-of-pocket expenses on the rise in healthcare, patients are looking out for better personalised financial planning, ease of making payments in a more convenient manner. Apart from providing better facilities, healthcare providers are scouting for new avenues to make customer relationship better by incorporating technological innovations within their system.

The last few years have witnessed several fintech companies venture into the medical finance space in the country. So how does fintech work in healthcare sector?

Addressing healthcare challenges

In days to come, new financial technologies will help the healthcare sector maintain payments with providers using the capabilities to make electronic bills more accessible. Overall, it will have less impact on the time spent on administrative work and offers a path to streamline some of those back-office functions and gives healthcare workers more time to focus less on administrative management and organisation and more on the bottom line: delivering high-quality patient care.

Nilesh Jain, MD and Co-founder, Clinivantage HealthCare Technologies says, “As the benefits of innovation and disruption in the financial sector aid benefits to individuals, businesses and institutions, similar expectations of access to information, empowerment, performance, services and personalisation will demand innovative products and services from healthcare providers. We will see more innovative models that will help drive improvements in traditional financial services in healthcare.”

According to Manish Jain, MD and Head, Com-

mercial Banking, India, Standard Chartered Bank, firstly, there are significant developments happening in the payment / collection infrastructure. Secondly, patients also now have multiple options in the form of digital platforms leading to better access to credit and multiple online payment options and creative insurance products from new and emerging players leading to massive multiplication of health coverage to hitherto uncovered population.

Dr Rajendra Patankar, COO, Nanavati Super Specialty Hospital says, "We are on the cusp of great digital transformation and FinTech, which combines technologies with financial instruments, solutions and services, is all set to disrupt the Indian healthcare sector. We are witnessing a new healthcare economy fully driven by a digital transformation. It is true that FinTech companies offer huge support in addressing the healthcare challenges in the country. The leveraging of data to make decisions and guide the underwriting process brings down the risk of defaults on loans. Moreover, in the case of a medical loan, the amount is credited directly to the hospital's bank account, thus eliminating the possibility of the misuse of funds."

Salabh Pahliwal, Chief Financial Officer, Jaslok Hospital and Research Centre comments, "Not only customers but also healthcare organisation is searching alternatives of the financial services which can help them in accessing widespread customers. There are many apps these days which not only help customers in selecting appropriate health insurance suitable to their requirement but also paying for the same online and reducing lead time and efforts drastically."

Fintech is helping to build an integrated and sustainable healthcare ecosystem in India. According to Ashish Gupta- CEO, Docprime.com and Tech Evangelist- Policybazaar.com, the end goal is to empower customers and decrease medical cost burden.

Gupta further adds, "FinTech is undoubtedly shaping the face of the Indian healthcare industry. Some of the fintech-driven changes that can be witnessed in the healthcare industry are better engagement with customers, price or treatment cost transparency, management of unplanned medical expenses, better claim settlement experience, convenience in terms of better clinical care, digital payments and customised medical loans etc."

We will see more innovative models that will help drive improvements in traditional financial services in healthcare

Nilesh Jain
MD, Co-founder,
Clinivantage HealthCare Technologies

We are on the cusp of great digital transformation and FinTech, which combines technologies with financial instruments, solutions and services

Dr Rajendra Patankar
COO,
Nanavati Super Specialty Hospital

FinTech solution may offer a mid-way where healthcare companies will be able to reach out to customer without spending huge money on promotions

Salabh Pahliwal
Chief Financial Officer,
Jaslok Hospital and Research Centre

FinTechs have helped not only in handling collections and payments but also in managing downstream processes like reconciliation

Manish Jain
MD & Head, Commercial Banking, India,
Standard Chartered Bank

FinTech is undoubtedly shaping the face of the Indian healthcare industry

Ashish Gupta
CEO, Docprime.com and Tech Evangelist- Policybazaar.com

Improve operational and cost efficiencies

Healthcare providers are shifting to value-based models and in order to remain profitable and sustainable, focussing their delivery models on patient outcomes. While improving patient experience, providers should provide better care at low cost. Not only customers, but also healthcare organisations aresearching alternatives which can help them in accessing widespread customers.

So, what goals should the healthcare providers set to make the system more conducive both for them and their customers apart from improving the operational and cost efficiencies, while selecting financial services?

According to Jain from Clinivantage HealthCare Technologies, successful healthcare providers must align their goals with the requirements of payment models. He further says, "There is a need for risk adjustment tools to help the organisation understand and increase or decrease its risk profile appropriately. Resource allocation and utilisation reporting should be at the point of care. Providers will need a good sense of how they are spending money as they take on increasing risk. Financial system should allow management of profitability; more importantly, should facilitate collaboration between the finance and quality improvement teams by helping identify the specific, actionable clinical initiatives that would have the most impact on profits and per-

formance on improved patient outcomes."

"FinTechs have helped not only in handling collections and payments but also in managing downstream processes like reconciliation. Healthcare sector partnering with banks and fintechs for digital solutions will overall result in improvement of operational efficiency and reduction of cost," informs Jain from Standard Chartered Bank.

Says Dr Patankar from Nanavati Super Specialty Hospital, "Amid an ongoing digital revolution in India's healthcare system, FinTech companies integrate transparency, discovery and financing that help patients in comparing prices of surgeries, quality of hospitals and doctors and pay in EMIs."

Pahliwal says, "There are many apps these days which not only help customers select appropriate health insurance suitable to their requirements, but also to pay for the same online and reduce lead time and efforts drastically."

Says Gupta, "The FinTech technology is the backbone of our company. With the help of this technology, we have built an integrated appointment management system for all our partners. This allows us to effectively manage patient appointments on our partners' behalf and makes it easy for us to keep a track record of partner payments and on time direct payments."

Financial stability for healthcare organisation

The need of the hour for healthcare providers is financial stability and it can be achieved only when there is an ease of doing business. Apart from streamlining billing and payment systems while improving cash flow, providers can work to reduce costs to patients and improve the quality of care through technology advancements and disruptive approaches.

Dr Patankar elaborates, "Availability of digital financial products are great enabler. By creating a sustainable ecosystem, the ultimate aim of the industry would be to ensure a significant impact on the country's gross domestic product (GDP). FinTech brings ease of payment for the consumer, it empowers the consumer and changes the way healthcare institutions interacts with their consumers. Increase in usage of FinTech services has positive impact leading to debility in prices paid by the consumer and cashback has been a main attraction."

Healthcare sector partnering with banks and FinTechs for digital solutions will overall result in improvement of operational efficiency and reduction of cost.

Says Jain from Standard Chartered Bank, "Healthcare providers see banking and fintech arrangements as a vital element in providing enhanced patient experience. FinTechs have helped not only in handling collections and payments but also in managing downstream processes like reconciliation."

Gupta says, "Healthcare

providers can leverage the data in a more systematic and efficient way to guide the underwriting process. This can help in minimising the default on loans."

Impact on healthcare providers

There has been easy accessibility of electronic bills due advanced financial systems built in collaboration with hospitals, insurance companies and other service providers, which has helped improve data quality leading to greater personal empowerment.

Says Jain from Clinivantage HealthCare Technologies, "E-payments can create greater transparency, rich data on use and cost of healthcare services, and generate reporting efficiencies." He adds, "FinTech also improves the efficiency of the healthcare staff. Instead of using outdated IT systems, engaging in endless paper filing or eternal phone calls, fintech can help streamline back-office functions, giving healthcare workers more time to focus on delivering high-quality patient care. The trend is moving toward customers owning their own data. Hence, capitalising on financial technology could connect hospitals with patients on a personal level and generate insights to better assess the value of care."

With 24/7 easily accessible data in hand, customers are now relieved. This has also lead to insurance companies using the same data to understand their customer's more. FinTech has made healthcare and insurance more affordable as inefficiencies in the system have drastically reduced.

Future trends

FinTech 2.0 will deliver fundamental changes to the infrastructure and processes at the core of the financial services along with the healthcare industry.

Dr Patankar says, "FinTech 2.0 would now pick up the baton and focus on the next 500 million of the population. We foresee many patient-centric solutions coming in that will completely transform the healthcare delivery systems solutions. The biggest assets will be created of robust database with the provider's / healthcare institutions that can be a game changer for the healthcare delivery system."

According to him, FinTech 2.0 would cover segments across urban and rural areas narrowing on Tier I and Tier II cities. In order to create a cost-effective and sustainable ecosystem to serve the untapped segments, a few interventions are proposed. Considering the lifestyle and eating habits of the people, there are many lifestyle diseases which affect our life. FinTech can be leveraged to cater to the need of preventive care enabling people to not only plan their medical expenses but also keep a check on their health.

Replace unplanned medical savings

Patients can reduce out-of-pocket expenditures, medical poverty traps, and unplanned medical savings with strategic fintech-enabled healthcare solutions. Technology in healthcare finance can be leveraged to create patient-centric solutions which can help save and plan for medical expenses in advance.

Jain from Clinivantage HealthCare Technologies says, "A strong fintech platform will bring easier access to healthcare. Technologies need to be better linked and integrated with each other. FinTech solutions focussed on healthcare can help manage out-of-pocket expenditures. Technology in healthcare finance can create patient-centric 'savings plan' solutions to plan for their emergency medical expenses."

Fintech can help resolve the following

- Regulatory frameworks for the integration of FinTech and digital health
- Applications of FinTech, like peer to peer and EMI savings based plans to address growing and complex patient out-of-pocket challenges
- Integration of financial solutions as the source, by integration into solutions, defining strategies at source to advance from idea to execution in deploying disruptive solutions with integrations like ours.
- From the time a case is identified, the financial assistance is required to pilot programmes achieving real-time payment processing via integrated platform services.
- Partnerships and business models for efficient adoption of platform technologies and fintech applications with providers, payers, and patients.
- Mobile payment and mHealth to facilitate ease of access for patients
- Value-based care and approaches that tie together financial and healthcare data
- Smart contracts to streamline cash flow, procurement and improve reliability
- Considerations for FinTech's utility in the reduction of fraud, waste, and abuse within healthcare

Source: Clinivantage HealthCare Technologies

> FinTech 2.0 will deliver fundamental changes to the infrastructure and processes at the core of the financial services along with the healthcare industry

Study conducted by various industry bodies indicate that only 10 per cent of the population in India are medically insured. A lot of financial bodies provide loans to families who are financially fragile.

Says Dr Patankar, "FinTech-enabled health solutions can empower people with financial back up with innovative pay back solutions. The need for creating a feasible healthcare financing model acts as the catalyst which has triggered the medical loans, which are unsecured. FinTech-based solutions will be a turning-point for the category."

"There has been a rise in cost of surgeries and post operation expenses are also huge. In the absence of medical insurance, when people generally opt for surgeries, on financial front they are open to a bigger risk. There are startups which offer saving plan for such non-emergency medical services where patient can save money on a everyday-basis," says Pahliwal.

Leveraging the benefits of FinTech?

By the use of technology in healthcare finance, healthcare institutions would be able to reach the smaller towns in India while increasing access to medical care and reducing costs.

Jain from Clinivantage HealthCare Technologies asserts, "Making health financing more secure and efficient through technology, FinTech delivers the demands while creating more tailored, medical experiences for the end user. With the merging of technology finance and healthcare in India, endless possibilities in the healthcare affordability ecosystem could be achieved."

FinTech solutions can improvise inefficiencies in supply chains, streamline cross-stakeholder collaboration and solve gaps in identify management. Says Dr Patankar, "FinTech is not just about digitising money but it's about monetising data. Collation and analysation of data can bring in a new dimension to the patient data and physician behaviours. This will help healthcare institutions learn stakeholder loyalties, engage in meaningful conversations, recognise and resolve issues and much more."

Pahliwal says, "FinTech solution may offer a mid-way where healthcare companies will be able to reach out to customer without spending huge money on promotions. Better patient services can be offered where financials can be managed technologically, and companies can focus more on better patient services thereby improving overall customer satisfaction."

Says, Jain from Standard Chartered Bank, "Standard Chartered has a complete suite of solutions designed to reduce the high wait time at the time of billing. Our solution on this front is a customised mix of UPI, Cards and IMPS-based collections channels. These are real-time and help in reducing billing time significantly, while at the same time are cost efficient. For the challenge of delayed realisation/application of funds, we offer clients a solution which enables identification of remitter/sender and provides enriched information around each payment received thereby further simplifying the application of funds. We are also working with clients to automate the entire banking process, including the payments process."

In days to come, FinTech is likely to take the centre stage and revolutionise the way the entire healthcare system works. Strategic tie-ups between hospitals and financial institutions will boost the sustainability of FinTechs, which is indirectly going to boost the medical loan system and build a sustainable ecosystem in healthcare.

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INTERVIEW

Urban health is a catastrophe waiting to happen

After the devastating earthquake in Latur, Maharashtra on September 30, 1993 the Americares Foundation airlifted vital medicines and medical supplies to ensure access to medicine for the survivors. Today, they are involved with Cyclone Fani but their work goes beyond disaster relief. **Rachel Granger**, Vice President- International Partnerships and Programs, Americares Foundation and **Shripad Desai**, MD and Country Director, Americares India Foundation review the journey over the past 25 years and explain to **Viveka Roychowdhury** why they decided to focus on local health centres and urban health in India

Could you tell us more about Americares and the work you do around the world Granger?
Americares is a health-focussed relief and development organisation that saves lives and improves health for people affected by poverty or disaster. Each year Americares reaches more than 90 countries, including the US, with life-changing health programmes, medicine and medical supplies.

We envision a world in which all people have pathways to health and opportunity. We believe that for people affected by poverty or disaster, health is essential. With good health, people can attend school, be productive at work, care for their families and contribute to a strong community. Poor health puts all of that at risk. Health is fundamental to all aspects of development.

Therefore, Americares invests in local health centres. When local health centres thrive, so do people in their communities. Our programmes help communities prepare for, respond to and recover from disasters; increase access to critical medicine and medical supplies; improve and expand clinical services; and prevent disease and promote good health in vulnerable communities.

> Americares reaches more than 90 countries, including the US, with life-changing health programmes, medicine and medical supplies

What are the focus areas of Americares India Foundation?
Desai: Americares India Foundation builds on the global as a health-focussed relief and development organisation with a particular emphasis on urban health. Our programmes align with our global interventions in emergency programmes, access to medicines, and clinical services together with community health. Since inception, Americares India's work has been characterised by compassion, expertise, quick response and effective aid for the people who need it.

Over the last decade, the Americares India team has launched large scale response and recovery efforts following emergencies in India including the Rajasthan flooding in 2017 and more recently the Kerala flooding to provide immediate aid and help restore quality health services. We support and deliver quality healthcare services at public hospitals and in low income communities, preventing and treating illness and promoting good health for each patient. Through our mobile health centres and partner clinics, we provide patients with treatment, prevention, education and health management services. We also provide referral services to our network of partners to help patients navigate the healthcare system. Finally, we design and implement sustainable programmes in school and low-income communities in order to strengthen community health.

What is the source of funding, resources for the activities being conducted by the Americares India Foundation?
Desai: Being a non-profit, Americares India Foundation solicits funds from corporate donors and foundations for the programmatic work. We work closely with the corporate CSR teams/ Foundations, with aligned strategic vision to partner for programmes. Americares India Foundation a charitable organisation registered in India, raises majority of funds from donors within India and part from our global donors.

> Americares follows a structured project management process that involves monitoring and evaluation as a vital component

How does Americares choose to allot funds, resources for the projects it chooses?
Desai: Our mission is to save lives and improve health of people affected by urban poverty and disaster so they can achieve their full potential. We design and implement high quality programmes to address the needs of these population. Our core health themes include Mother and Child Health, Infectious Diseases, Mental Health, NCD (hypertension and diabetes) and Health System Strengthening. We channelise our resources to address the needs of these population through our programmes.

How does Americares monitor the outcomes and benefits of the projects and programmes? For how long etc?
Desai: Americares follows a structured project management process that involves monitoring and evaluation as a vital component. A dedicated team tracks the achievements for each programme versus the set outcomes.

What are the focus areas of these interventions globally and in India? What kind of partner network does it engage with?
Desai: Globally, Americares invests in local health centres. When local health centres thrive, so do people in their communities. Our programmes help communities prepare for, respond to and recover from disasters; increase access to critical medicine and medical supplies; improve and expand clinical services; and prevent disease and promote good health in vulnerable communities.

Americares India Foundation builds on the global as a health-focussed relief and development organisation with

a particular emphasis on urban health. Our programmes align with our global interventions in emergency programmes, access to medicines, and clinical services together with community health. Since inception, Americares India's work has been characterised by compassion, expertise, quick response and effective aid for the people who need it.

How is Americares engaging with government programmes like Ayushman Bharat, etc?

Desai: Our focus is to collaborate with government to catalyse their health interventions and priorities. Our programmes therefore are rolled out in collaboration and partnership with the local government. Be it our mobile health centres, school health programme or health centre strengthening we work with the local government and public health facilities. During disasters, we work closely with the government to improve access of medicines, medical supplies and aid at the government health facilities. In Kerala, we are supporting the upgradation of 67 primary health centres (PHCs) to family health centres (FHCs) in line with Ayushman Bharat Family and Wellness centres.

What is the long term strategy for the Foundation in India?

Desai: Our India strategy focusses on building 'Thriving Urban Health Centres', through capacity building, infrastructure support, service delivery and connecting them to conscious communities. We aspire to maintain the synergy with our global vision while customising the strategy to address the local mission of being the urban health catalyst.

How is Americares involved with natural disasters like the ongoing Cyclone Fani and the floods that hit Kerala last August?

Desai: Americares is responding to Cyclone Fani survivors, conducting health camps and ensuring medical supplies. We are supporting more than 3,000 families in the affected districts ensuring access to safe drinking water, shelter and hygiene kits. Post the relief efforts Americares will assess the damage to the health centres and support the rehabilitation efforts.

To restore and improve health services for survivors of the devastating August 2018 floods in Kerala, Americares India is donating medical and diagnostic equipment to flood-affected health centres. With support from multiple donors, Americares is upgrading of 67 Family Health Centers across seven districts in Kerala. Upgrades of Family Health Centres are part of Americares India's emergency response and recovery programmes following the historic floods in Kerala. A Family Health Centre provides universal (whether patient approaches an institution or not) and comprehensive (promotive, preventive, curative, rehabilitative and palliative) health services to strengthen the health care system. The upgrades will be part of the 'Ayushman Bharat – Family and Wellness Centres' under the 'Ayushman Bharat' national programme announced by Prime Minister Narendra Modi.

These floods and landslides in Kerala, during the monsoon of 2018, caused permanent damage to health equipment, assets and overall health facilities, leading to diminished services, reduced efficiency and placing a huge burden on the health system going forward. Kerala is known for its network of effective local health centres, engaging with the community to achieve better health outcomes.

In addition to health centre upgrades, Americares India is also focussing on two other key areas of intervention in conjunction with the state government:

The first is on Mother and Child Nutrition. A vulnerable population of lactating mothers and children are at risk of compromised nutrition that can have long-term impact on the growth of babies. Americares is working with the government to provide nutritional support to 11,000 mothers and children in the worst affected districts of the state. This is being done in a programme identifying the mothers at risk through the ASHA (health worker) network and reaching out to them through health education and product support.

The second is the Mental Health Programme. Post-traumatic stress disorder (PTSD), anxiety disorders and other mental health issues are common after such large-scale disasters. Kerala has a high burden of people facing mental health issues, including senior citizens and individuals suffering from alcoholism who need support post-disaster.

The state of Kerala, NIMHANS Bengaluru and Americares are undertaking a large-scale programme spanning over one year, collaborating among health centres, counsellors, ASHA and communities to identify individuals with mental health issues and connect them to health centres for treatment. Americares is supporting the training and capacity building of the counsellors and ASHA, in 275 panchayats as part of this field-based programme to strengthen the mental health management and capacity within the state.

Why has Americares chosen to focus on the urban poor?

Desai: Rapid urbanisation has outpaced the public healthcare infrastructure growth in India. By 2030, 50 per cent of India's population will be living in urban areas and approximately 50 per cent of urban population living in slums.

Life in overcrowded and unsanitary urban slums is dangerous for health, development and welfare. For millions of urban poor living in slums healthcare is not a priority due to lack of access, affordability, education and awareness. Urban slum dwellers are at risk of the double burden of both communicable and non-communicable diseases. Unless addressed now, urban health is a catastrophe waiting to happen.

Over the past decade Americares has developed transformational programmes to address the urban health gaps of access, awareness and quality of care and aspired to catalyse the urban health challenge in the coming years.

Tell us more about your global strategy.

Granger: At the core of our global strategy is a focus on health centres – helping them thrive.

Local health centres are the health posts, clinics and hospitals that serve as hubs of primary care and health-focussed activity in their communities. More than simply facilities, health centres include the health workers – from medical professionals to health educators – who staff them, as well as the people and communities they serve.

We define thriving local health centres as those with strength in four areas:

1. Professional capacity of the health centre itself;
2. Sense of care, respect, and dignity patients experience;
3. Community engagement to prevent disease and promote good health, while ensuring those served by a health centre have a voice in how it serves them; and
4. Connection with larger health systems for referral, support and resilience.

How do you see the relevance of the global vision and strategy to Indian context?

Desai: Our India strategy focusses on building 'Thriving Urban Health Centres', through capacity building, infrastructure support, service delivery and connecting them to conscious communities. We aspire to maintain the synergy with our global vision while customising the strategy to address the local mission of being the urban health catalyst.

How do you see Americares playing a role in driving urban health in India over next few years?

Granger: Americares will help to drive the discussion around urban health in India and continue to advocate for investment/support to urban health centres. This is particularly important because the urban population in India is growing at a more rapid rate than the rural so urban health centres will continue to see their service requirements increase. Addressing these needs will require the pursuit of creative public/private partnerships, which we are fortunate to have started developing, and raising the discussion level on the importance of good health as a core component to strong communities.

How do global healthcare players partner/contribute to your efforts?

Granger: Partnership with global healthcare organisations is a critical component to the success of Americares. We are the leading global non-profit provider of donated medicines and medical supplies, distributing over $900 million in medicine and supplies to more than 90 countries each year. We can match these donations with an expansive partner network of over 4,000 health centres in the US and around the world. These donations allow our partners to fill acute gaps and ensure that patients who otherwise would not be able to receive these medications now have the access they require.

What is the role of Indian healthcare players in your efforts in India

Desai: Healthcare players in India both local and global play an important role in driving health focus in India. Americares partners with leading healthcare players during disaster response, relief and recovery programmes.

We seek sustained and scalable strategic partnerships with healthcare players as we strive to build thriving urban health centres in India. Our health themes of mother and child health, infectious diseases, hypertension-diabetes and mental health are the issues most leading healthcare players care for. We therefore see a huge potential for synergistic partnerships aligned to their CSR vision in India.

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Huawei bets on Track.AI

The smartphone company through its AI platform intends to create strong partnerships and develop customer-centric innovations to tap new healthcare markets

By Raelene Kambli

DIGITAL TECHNOLOGIES have made the global healthcare business environment extremely fascinating. While in the last few years we saw corporate behemoths such as Apple, IBM, Microsoft, Samsung, Amazon, JP Morgan, Berkshire Hathaway, venturing into healthcare with specialised technologies to create value, similarly Huawei, the ICT infrastructure company is taking several strides to increase its healthcare technology offering in global markets. The company's primary strategy is to develop customer-centric innovations and create strong partnerships in the healthcare space. Interestingly, the company will enter the Indian healthcare market with its Track AI product soon.

Huawei's healthcare partnerships

In the past, the company had partnered with Philips and developed a cloud healthcare solution primarily for second-tier cities in China, which would provide high-quality cloud healthcare services to communities that lacked advanced healthcare systems. This solution integrates Philips' personal healthcare, disease diagnosis and treatment, management expertise and system platform with Huawei's complete IT infrastructure, IoT connectivity and cloud AI capabilities to increase efficiency and accuracy of diagnostics and treatments.

Again in March 2019, Huawei partnered with Yitu Healthcare to develop an intelligent healthcare cloud backed by AI that can integrate healthcare data into efficiency and effectiveness.

At the Mobile World Congress (MWC2019) this year, Huawei's Deputy Chairman, Ken Hu, disclosed the launch of Huawei's digital inclusion plan

MAJOR FOCUS AREA OF DIVE MEDICAL

About 19 million children worldwide are visually impaired, and 1.4 million of them are completely blind. Yet 70 per cent could have had normal vision if they had been treated on time. Visual problems frequently go undetected because the technology used to diagnose them suffers from several drawbacks. Currently, ophthalmologist use basic analogue examination procedures, which require great experience from professionals, and cannot produce accurate and repeatable results. There is a solution to this problem and this is the reason DIVE was created, and now developing the TrackAI project.

"Tech4All" and three key actions: Connect, apply, and skill, and put forward the goal "5 years for 500 million people to benefit from digital technology'. In Line with this vision, the company has partnered with leading research institute, IIS Aragon and DIVE Medical — a startup, to co-create an AI-powered assessment for early signs of visual impairment. They call it Track.AI, an initiative to provide a unique value for visual impairment children community to make sure nobody is left behind.

Now, IIS Aragon is a consortium of Miguel Servet University Hospital and the University of Zaragoza, Spain. Researchers and senior ophthalmologist Victoria Pueyo and Engineers Marta Ortin, Belen Masia, Diego Gutierrez, and Jose Ignacio Echevarría from these institutions have founded the DIVE Medical startup, which has designed a device to help ophthalmologist make more timely, accurate diagnoses and better decisions about treatment to prevent blindness. The reason for Huawei to partner with these institutions and start-up is to promote Track.AI, globally. Additionally, data is being collected in China, Mexico, the UAE, Spain and Vietnam. The device is currently being used for research. The DIVE team is right now finishing the validation phase and will shortly begin the regulatory process.

Explaining the rationale behind this initiative, Tornado Pan, Country Manager (Huawei Brand), Consumer Business Group, Huawei India, informs, "The pace of technology moves very fast and we want to make sure that nobody is left behind. Technology is for everyone and it should enrich people's lives. We hope that people begin to understand the positive nature of AI and how together with humanity, we can make truly amazing changes that make a real impact on people. The world needs a way to diagnose early childhood blindness – one that's portable, inexpensive and easy to use." Huawei is funding the Track.AI project.

Tornado Pan, Country Manager (Huawei Brand), Consumer Business Group, Huawei India

What's so unique about Track.AI

According to the Huawei, many visual problems remain undiagnosed until it is too late, giving rise to visual, educational and social consequences in children. The introduction of AI in DIVE will help identify visual disorders in early stages, without the need of highly experienced physicians or medical settings. Non-trained people could run the test for many children from six months of age anywhere, using a fast and portable tool, and identify those with visual problems who need to be referred to an ophthalmologist.

DIVE has developed tests to identify visual problems in children by exploring gaze patterns on carefully designed visual stimuli. A huge amount of accurate and objective data of the gaze position of the patient is obtained using DIVE's eye tracking capabilities. This data is directly related to the patient's visual function: oculomotor control, visual acuity, contrast sensitivity and colour perception.

The DIVE (Devices for an Integral Visual Examination) device, built with a HUAWEI Matebook E Hybrid laptop, has eye tracking capabilities which allow it to know the point of the screen the patient is looking at with high precision. DIVE communicates with a HUAWEI smartphone (HUAWEI P30), which the doctor will use to control the system and manage gaze data collection. The captured gaze data is analysed and passed onto the smartphone app via Bluetooth. The smartphone will then run the AI algorithm to estimate the probability for the patient to have certain visual pathologies. This result is used by the doctor to determine what specialist care is needed.

Giving more details on the project and Huawei's plans, Pan adds, "Track AI leverages AI and is an eye tracking device that also puts children's lives back on track. The project, Track.AI is part of Huawei's wider commitment to push the boundaries of what is humanly possible and use AI for good. This project makes it easier to detect visual impairments in a faster and more efficient way. Through this project, Huawei is continuing to promote digital inclusion and would like more partners to join and more projects could be driven by the digital inclusion effort."

Further on, he informs that the Track.AI system is designed to examine several aspects of visual performance, which cannot be assessed by traditional examinations, especially when the patient is too young. The Track.AI application helps doctors facilitate highly-skilled diagnosis through the contained AI algorithm inside the app. This means that a local doctor can get a good idea of which patients need expert care using this tool and can easily identify any serious impairments accurately as well as predict future issues.

How will DIVE solve critical health issues and which areas of ophthalmology will they focus on?

Pan explains, "This combination unleashes the potential not only to measure the visual function, but also to estimate the probability of the patient having a certain pathology. Track.AI will identify disorders such as strabismus, significant refractive error, media opacity, retinal disorder, optic nerve disorder, or cerebral visual impairment. The sophisticated HiAI platform performs at an ultra-high function resulting in a greater degree of accuracy."

The fact that Track.AI is currently being researched in different decree to acquire regulatory approvals, we asked Huawei to expound on the research done during the development phase. Replying to the same, Pan further explains, "Before this collaboration with Huawei, the DIVE team had run tests with more than 2,000 children, with a very wide range of visual and developmental issues. Researchers from DIVE are currently publishing these findings in high-impact medical journals. First, they are reporting visual behaviour in children with normal visual development, which will allow them to identify those showing abnormal patterns. They have examined hundreds of children with different visual problems, and their research group is finding main visual outcomes providing earlier disease diagnosis and better follow-up."

HOW DOES THIS DEVICE FUNCTION?

The DIVE device presents carefully designed stimuli on a high-resolution screen, and captures the gaze of the patient using eye tracker technology. It examines several aspects of the visual function: oculomotor control, visual acuity, contrast sensitivity, and colour perception. It has been used in more than 2000 patients, and can be used with babies from six months of age.

The final launch plan

After all the regulatory approvals, Huawei plans to introduce this device to ophthalmologist and paediatricians around the world so that they can perform more accurate and faster explorations of visual functions and produce earlier diagnosis of visual pathologies. The company also has a blueprint prepared to organise training programmes to empower non-trained people to identify children who may have visual impairments and to refer them to a specialist who can treat them.

Success in the Indian market

Going forward, Huawei will need to develop a good strategy to introduce this device in India. The reason is, currently India has a huge startup community and innovators who are already working and developing such technologies for Indian patients and are ready to sell these products at low costs. The challenge will be to compete with such companies and ensure that they provide value to Indian customers. In India, Huawei is one of the fastest growing smartphone brands. It currently has around 4.5 per cent of the smartphone market, as per IDC, while Counterpoint Research puts its share at around 3.5 per cent. However, the recent news about US major Google deciding to suspend ties with the company may cause a dip in sales. Nevetheless, if the company manages to resolve these issues, this fast growing smartphone company can have a better brand recall and since, the Track.AI is well integrated with the Huawei smartphone, it will have a higher advantage than other devices.

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INTERVIEW

India has 1/5th of world's preterm babies

Of the 15 million babies born preterm globally, 1/5th are born in India. Given that prematurity is the leading cause for death in children under 5 years across the globe, there is no doubt that India has a huge need for neonatal critical care facilities. But **Dr Amish Vora**, Senior Consultant NICU, PICU and ECLS, Narayana Health - SRCC Children's Hospital explains to **Viveka Roychowdhury** that awareness about neonatal health is not as high as it is for cancer or cardiac diseases

> There are international as well as national guidelines for setting up a NICU which describes everything from floor planning, power supply, water supply, availability of personnel and equipment among other things

In medical terms, what is prematurity?
Duration of a complete pregnancy is 40 weeks (280 days). During this period there are multiple events happening in the women's womb that ends in a baby that is born which is ready for independent life. When a baby is born before 37 completed weeks of pregnancy, it is considered as a preterm baby. This is the standard definition followed worldwide. In other words, a baby is considered born preterm if it is born before its complete maturation inside the mother's womb.

What is the cost of setting up neonatal intensive care unit (NICU)? In terms of investments, time etc.
As per 2003 data the cost was Rs 3.7 crore, we don't have any new published data. I presume it will be much more than that now.

Are all NICUs same?
In 2012 the American Academy of Paediatrics has divided neonatal care into four distinct levels. Level I facilities (well newborn nurseries) provide a basic level of care to neonates who are low risk. They have the capability to perform neonatal resuscitation at every delivery and to evaluate and provide routine postnatal care for healthy newborn babies.

Level II (speciality-level facility) is for care of stable or moderately ill newborn babies who are born at =32 weeks' gestation or who weigh =1500 g at birth with problems that are expected to resolve rapidly.

Level III NICUs are defined by having continuously available personnel (neonatologists, neonatal nurses, respiratory therapists) and equipment to provide life support for as long as necessary. These units have facilities for advanced respiratory support and physiologic monitoring equipment, laboratory and imaging facilities, nutrition and pharmacy support with paediatric expertise and social services.

Level IV units include the capabilities of level III with additional capabilities and considerable experience in the care of the most complex and critically ill newborn infants and should have paediatric medical and paediatric surgical specialty consultants continuously available 24 hours a day. Level IV facilities would also include the capability for surgical repair of complex conditions (eg, congenital cardiac malformations that require cardiopulmonary bypass with or without extracorporeal membrane oxygenation).

Different NICUs have different capabilities and thus choice of NICU depends on the need of the patient as per his/her disease severity. Having said that, there are few things that need to be followed in all NICUs such as adequate space, good hand hygiene, adequate nursing, promoting baby friendly hospital policies, ensuring breast feeding and last but not the least tender love and care.

Does India have adequate number of such facilities?
No, there is a big deficit in the required number of beds and what's available. Especially in public sector which has lots of patients but less number of beds. Hence we need to have a Private Public Partnership with NGOs, companies with CSR activity like we have done for our paediatric cardiac and paediatric oncology programme.

Things are getting better with each day and there is increasing awareness about reducing neonatal deaths. Reducing child mortality is one of the Millennium Development Goals (MDGs) and neonatal deaths are a major contributor to this. Recognising this, the government has launched many programmes such as India Newborn Action Plan and Rashtriya Bal Suraksha Karyakram. Government has set up many Speciality Newborn Care Units (SNCUs) across the country.

Do we have adequate clinical staff, doctors as well as para medical staff for the volume of neonatal critical care facilities required in India?
There is shortage of trained nursing staff. Indian Academy of Pediadrics (IAP) and National Neonatology Forum (NNF)have done very well to make sure we have enough trained doctors by continuously working towards training of doctors, nurses and other health care professionals as well as providing standard protocols.

There are many NGOs and charitable trusts funding

neonatal healthcare. Corporate sector as part of Corporate Social Responsibility (CSR) is also helping out. Having said this, for a country as large as ours with nearly 1/6th of world's population, we need continued sustained effort towards getting to the goal of single digit neonatal mortality. There needs for better awareness regarding neonatal health as it is for cancer or cardiac diseases. There are still many births taking place outside hospitals in unclean settings. For many, quality neonatal care is still out of reach.

What are the health issues that crop up most frequently in pre term babies in India, that neonatal critical care facilities need to be equipped to handle?

New-born babies constitute one of the most vulnerable group even when born healthy and at term. Prematurity makes them even more susceptible to adverse health outcomes. Prematurity is the leading cause for death in children under 5 years across the globe. Worldwide 15 million babies are born preterm out of which 1/5th are born in India. In recent years, the trend from most countries which have a reliable data collection shows that the rate of preterm birth is on the rise. Out of the 15 million babies born preterm, 1 million do not survive. Among those that survive, many suffer from many life long disabilities including hearing deficit and visual problems. In developed world, 9 out of 10 extreme preterm babies survives; where as in low income countries including Sub Saharan Africa and South East Asia, only 1 out of 10 extreme preterm survives.

They have immature lungs and need medication to make them mature, many preterm babies need artificial nutrition for which a special NICU should be equipped with. They need frequent ultrasound of their chest, heart and brain so (NICU) unit should be equipped with the machine and a trained person should be available 24x7. Some of the equipment are expensive, so it is not possible for all NICUs to have all the equipment and that's why there are standards, specifying what equipment is needed for each level of NICU. Also it is not only the equipment but making sure all the doctors and staff are trained to use that equipment and the importance of maintaining them.

What are the health issues that any pre term baby needs to be monitored for?

Preterm babies need to be monitored that their oxygen level is within normal limits at all times; neither too low nor too high as both causes harm to the baby. Their heart and brain needs to be looked at few times in the first week of life. Their brain also needs to be looked at 14 days, 30 days and before discharge. Their weight needs to be checked every day to make sure they are gaining weight as per their gestational age. Head and length are monitored weekly. We have to watch like a hawk for any sign of infection and test for them as soon as needed. Infection is the biggest enemy for preterm babies. Their eyes need to be checked regularly and hearing before discharged. The neurological development needs to be checked regularly in the first two years to start early interventional programme if needed.

What is the post discharge care required for preterm babies?

While we support the babies until they are fit enough to go home, it is also important to check for their growth and development. This includes monitoring weight, length, head size, eye check-up, hearing screening among others to make sure that the baby is on the right tract. Hearing check-up and eye check-up are particularly very important because, if not done at the right time, it may be too late if realised later. These are some of the issues that are common across the globe.

We as a developing country face another important challenge which is infection. Preterm neonates have a very weak immunity and are prone to get infected. And once one child gets infected, the infection can then spread across the unit like a wild fire. Infection is a leading cause for death of preterm babies in developing countries like India.

What can be done to tackle the problem of infection?

There are many simple things if done correctly can go a long way. Simple thing as diligently hand washing can reduce infection by as much as 50 per cent. Another important aspect is isolation of babies with infection, so that it does not spread to others that are vulnerable. Any good NICU should have a designated isolation area for babies that are infected with bad bugs. Adequate spacing between the beds and adequate personnel to handle the number of patients present is also important. International recommendations are to have at least 120 sq feet of space per NICU bed which have been revised to 165 sq feet. Indian government recommends at least 100 sq feet. Also, there should be a minimum gap of 4 feet between two beds.

What are the rules that need to be followed when designing, planning for NICU, PICU and extracorporeal life support (ECLS). For instance, the Indian government recommends that there should be a minimum gap of 4 feet between two beds.

There are international as well as national guidelines for setting up a NICU which describes everything from floor planning, power supply, water supply, availability of personnel and equipment among other things. There are international standards right from 2008 and the latest update came in 2017 which states that minimum bed space for an ICU bed should be between 100 to 160 sq feet and for ECLS, it should be 200 - 240 sq feet. It also informs about the type of material to be used for the flooring/cycling, how much natural light and noise should be allowed in the unit, how many points you need for oxygen/air/suction/ electrical points and etc.

How does the Narayana Health - SRCC Children's Hospital facility differentiate itself from other such facilities?

SRCC Children's Hospital is the premier medical institution for children in Mumbai, backed by Narayana Health, the hospital combines unmatched paediatric medical experience with world-class facilities to ensure affordable, quality medical care for infants, children and adolescents. We are a fully equipped, staff and trained level IV NICU as per international standards. We can look after babies with all types of medical or surgical conditions including complex congenital or acquired conditions. We have all paediatric medical and surgical sub-specialities on site. We have the facility to transport all sick babies with two state-of-art critical care ambulances with a dedicated number to call (+91 22 71222333) and we provide education outreach to all our refereeing hospitals / doctors / nurses.

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INTERVIEW

Hospital-acquired Infection a high risk for patients in India

Dr Victor D Rosenthal, Founder and Chairman of The International Nosocomial Infection Control Consortium (INICC) speaks to **Prathiba Raju** on increasing risk and adverse effect of hospital acquired infection and AMR among patients in India

What is nosocomial infection control and what are the measures to control it?
Nosocomial infections are also referred to as Hospital-acquired Infection (HAI). Measures to control the infections comprise of identifying patients at risk of getting infected, evaluating hand hygiene practices, monitoring and surveillance of medical instruments such as vascular catheters, respiratory tubes, and other hospital gear. Additionally, behavioural change is an important component for controlling the spread of HAIs along with proper training to healthcare workers when dealing with patients.

The hospital settings are at a highest risk of acquiring these infections especially the intensive care units and operating theatres. Hence, it is of umpteen importance that control measures are practiced to stop the infection spread. The breeding ground for such infections can also be nursing homes, rehabilitation centres, the healthcare staff, susceptible patients, contaminated equipment and devices, bed linens, air droplets along with contaminated food and water.

> Central-venous-catheter-Related Blood Stream Infections (CRBSIs) are a common cause of hospital-acquired infection associated with morbidity, mortality, and huge costs

How Device Associated-Hospital Acquired Infections (DA-HAIs) are among the principal threat to patient safety and is the main causes of patient morbidity and mortality?

What is the status in India?
Patients in the ICU can get infected with diseases like pneumonia, bloodstream infection and urinary tract infection (UTI) due to contamination. Some of the most life-threatening bacteria that infects the ICUs are *Acinetobacter, Pseudomonas*, and *Klebsiella*.

Over the years, there has been an increase in HAIs among patients in India. The infections are caused due to the lack of compliance with infection control guidelines, such as hand hygiene, use of outdated technology, misuse or excessive use of antibiotics and more. These infections are further leading to morbidity, mortality and increased financial burden among patients. Implementation of proper guidelines and preventing the infection with bacterial resistance rather than treating it with antibiotics will help reduce the disease burden.

What are the chances of bloodstream infection, ventilator-associated pneumonia, catheter-associated urinary tract infection, non ventilator-associated pneumonia? How can these be avoided?
In 20 cities of India during 10 years, we collected data from 236,700 ICU patients for 970,713 bed-days. Pooled device-associated healthcare-associated infection rates for adult and paediatric ICUs were 5.1 central line-associated bloodstream infections (CLABSIs)/1,000 central line-days, 9.4 cases of ventilator-associated pneumonia (VAPs)/1,000 mechanical ventilator-days, and 2.1 catheter-associated urinary tract infections/1,000 urinary catheter-days In neonatal ICUs (NICUs) pooled rates were 36.2 CLABSIs/1,000 central line-days and 1.9 VAPs/1,000 mechanical ventilator-days. Non ventilator associated pneumonia represent less than 10 per cent of all healthcare acquired pneumonia, and they usually are caused after aspiration.

Extra length of stay in adult and paediatric ICUs was 9.5 for CLABSI, 9.1 for VAP, and 10.0 for catheter-associated urinary tract infections. Extra length of stay in NICUs was 14.7 for CLABSI and 38.7 for VAP Crude extra mortality was 16.3 per cent for CLABSI, 22.7 per cent for VAP, and 6.6 per cent for catheter-associated urinary tract infections in adult and pediatric ICUs, and 1.2 per cent for CLABSI and 8.3 per cent for VAP in NICUs.

They can be avoided by applying bundles of infection control measures.

As an example to prevent Blood Stream Infections (BSI) following are key measures: Maximal barrier, avoid femoral vein, skin antisepsis with chlorhexidine, sterile dressing impregnated with chlorhexidine, needle free connectors, single use flushing protocol, collapsible IV fluid bags, keep line when is necessary, don't replace lines with fixed intervals, and replace administration set every 96 hours.

How HAI are aggravating the AMR among Indian patients? Why should India take HAI seriously? Also, share the outcomes of the study you had conducted?
Antimicrobial Resistance (AMR) is associated with healthcare-associated infections (HAI), both the

issues are becoming a major threat to the country as cases have increased enormously. There is a connection between HAI and AMR as the approach taken at times is to prevent hospital acquired infections with antibiotics which leads to many people consuming large proportion of antibiotics which leads to resistance towards those drugs. AMR has also become one of the leading causes of deaths in the country.

Additionally, Central-venous-catheter-Related Blood Stream Infections (CRBSIs) are a common cause of hospital-acquired infection associated with morbidity, mortality, and huge costs. The adverse impact of CRBSIs has been observed in both, patients with central and peripheral vascular catheters. The use of peripheral vascular catheters is ten times more in hospitals than central vascular catheters. Hence, total number of BSI in patients with peripheral vascular catheters is five times more than the patients with central vascular catheters. It is shown that in the case of sepsis, around 60 per cent of patients die in the intensive care unit (ICU).

The study published in 2015 by INICC evaluated the rates of device associated infections across 40 Indian hospitals compared to several other countries. The studies were conducted on patients in intensive care units (ICUs). The findings specified that 7.92 central line-associated bloodstream infections occurred per 1,000 central line-days, 10.6 catheter-associated urinary tract infections per 1,000 urinary catheter-days and a ventilator-associated pneumonia rate of 10.4 per 1,000 mechanical ventilator-days.

In India, doctors, nurses to patient ratio is less. Having one nurse for 3 ICU beds, insufficient hospital funds, isn't full infection control programme a challenge? What are the immediate steps required to overcome this?

The ideal scenario at ICU is to have a nurse to patient ratio of 1:1. Other than that the necessary components of an infection control program are an adapted bundle, education, surveillance of HAI rates, benchmark with standards, measurement of extra length of stay, extra mortality and extra cost due HAIs, monitoring of compliance with hand hygiene and bundles to prevent HAIs, and performance feedback to health care workers. Always consider cost effectiveness when a new product shall be incorporated to the bundle of care. At hospitals participating in INICC program, the above-described strategy reduces HAI rates more than 50 per cent during the first four months of intervention.

How does INICC, the non-profit international research center, help to prevent HAI in developed and developing countries, particularly India?

The International Nosocomial Infection Control Consortium (INICC) is an international, non-profit, multicentric healthcare associated infection (HAI) cohort surveillance network. The INICC comprises of affiliated infection control professionals from 1,000 hospitals in 67 countries and is the only source of aggregate standardised international data on HAI epidemiology.

Recently, we partnered with Becton Dickinson (BD-India) to organise Heal-o-nomics'. The program is conceptualized to apprehend the challenges of preventing HAIs with the aim to achieve better health outcomes at optimised cost. We received a great response from some of the healthcare institutes based in Delhi and Bangalore. We hope such initiatives will help in reducing the disease spread caused by hospital-acquired infections and help in better treatment and care.

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INTERVIEW

'We are currently focussing on oncology care'

Dr Rakesh Kumar Vyas, Medical Director, Radiation Oncology, Balco Medical Centre speaks to **Prathiba Raju** about how Balco Medical Centre (BMC) a specialised cancer hospital is serving people of central India by offering a holistic treatment for cancer patients

BMC's motto is providing cancer treatment with 'Compassion, Care & Cure.' It is estimated that for a comparable cancer treatment in BMC and a similar tertiary cancer centre, the cost at BMC would be less by 20 to 30 per cent

How important is Balco Medical Centre (BMC) and how is it serving the people of central India as it is the only integrated oncology facility?

Worldwide, India ranks among the top three countries in terms of cancer incidences and mortality. For the year 2018, India has reported that 1,157,294 new cancer cases were detected and there were 784,821 mortalities attributed to this dreaded disease. It is estimated that cancer incidence is increasing at a CAGR of about 3 per cent and the trend is likely to continue in the future.

In India, in comparison to developed countries, there is low penetration of infrastructure and shortage of oncologists. Even within India, the availability of resources in Chhattisgarh is lower and majority of oncology facilities are located in Tier- I cities.

It is therefore evident that there is a significant shortage of proper medical care for cancer and thus, the importance of establishing a 170-bed cancer tertiary care hospital at Naya Raipur, Chhattisgarh cannot be overstressed. This cancer centre, equipped with state-of-the-art diagnostics and modern clinical labs, since its inauguration in March 2018, is in the forefront of providing world class, affordable cancer treatment.

Till now how many patients have benefited from this 170 bedded hospital, particularly the footfall of people from remote areas like Korba (Chhattisgarh) and Jharsuguda (Odisha)?

In one year since inauguration, the hospital has seen a total footfall of 3,092 patients of which 90 per cent are from the state of Chhattisgarh. Most of these patients are predominantly from Raipur and its surrounding districts. The state wise break-up is as follows:

i. Chhattisgarh : 2851
ii. Odisha : 113
iii. MP : 40
iv. Rest of India : 88

Item	Unit	USA	India	Chhattisgarh
Linear Accelerators	Per million population	11.8	0.3	0.18
Medical Oncologists		33	0.9	0.14
Radiation Oncologists		20	1.5	0.21

Completing a year, what is the disease pattern you have tracked in the patients, particularly in cancer care? How is the centre beneficial to tribal belt of Chhattisgarh and Odisha?

One year of BMC's operations have revealed that amongst women breast, cervix and ovarian cancer are most prevalent and amongst men, it is lip, oral cavity and lung.

Cancer treatment is protracted in nature. Earlier, many patients were forced to travel far and undergo the agony of staying away from home for extended periods. With BMC located closer home to the tribals of Chhattisgarh and Western Odisha, cancer patients of these regions can now easily avail modern cancer treatment at their doorstep.

You had mentioned over 250 cancer surgeries and 100 other surgeries in four months of operation. Can you elaborate on these?

BMC commenced surgeries from June 2018 and has, so far, conducted 344 surgeries with 310 surgeries related to cancer and 34 non-cancer ones. The bulk of surgeries is in three areas: head and neck, breast and abdominal cancers. For cancer surgeries, an integral part of the procedure is reconstructing the defect and we have used tissue from all parts of the body to reconstruct these defects. We frequently use Free Tissue Transfer, which is an advanced reconstruction technique that allows for precise reconstruction for better cosmetic and functional outcomes.

Breast services treat breast cancer with or without preserving the breast with immediate plastic reconstruction if desired by the patient. We have also pioneered sentinel node biopsy in the region which helps improve the quality of life of breast cancer patients.

Abdominal surgeries include surgery for digestive track as well as gynecological cancers. We employ laparoscopic minimally invasive techniques in as many patients as possible. This leads to a better recovery and outcome for patients and allows faster start of other treatment, like chemotherapy, when required.

Treatment for cancer is highly expensive. How cost-effective is BMC for patients?

BMC's motto is providing cancer treatment with 'Compassion, Care & Cure.' It is estimated that for a comparable cancer treatment in BMC and a similar tertiary cancer centre, the cost at BMC would be less by 20 to 30 per cent.

In addition, from the very inception of Ayushman Bharat, GoI's flagship health scheme, BMC has enlisted itself and is providing cashless treatment to the underprivileged sections of the society, even when the rates under the scheme are not financially viable.

> The hospital has many engineering features such as pneumatic chutes for transport of patient samples, Integrated Building Management System that includes latest fire detection, alarm and firefighting systems, access controls, surveillance systems and centralised monitoring of electrical and air-conditioning systems

Apart from specialised cancer care, will BMC introduce any other specialties in the upcoming years?

There is a demand from the surrounding communities to convert BMC into a multi-specialty hospital and with minimum effort many specialties can be introduced. However BMC is currently focussing on oncology care and in the future after consolidation may open other specialties.

What are the latest technologies used in BMC and how is digitisation helping the patients?

The hospital has many engineering features such as pneumatic chutes for transport of patient samples, Integrated Building Management System that includes latest fire detection, alarm and firefighting systems, access controls, surveillance systems and centralised monitoring of electrical and air-conditioning systems. In line with Vedanta Group's motto of Zero Harm, the hospital is environmentally friendly and is the only LEED (Leadership in Energy and Environmental Design) certified Gold rated hospital in Chhattisgarh.

Considering the importance of viewing cancer patient's information across time, all information of a patient, including his radiology and lab data is stored electronically and is available to the doctors seamlessly. This also enables the doctors to plan, superimpose and use the diagnostic information generated in one machine in another machine.

Located in Central India, do you think telemedicine will be useful? Does BMC conduct telemedicine consultations? If not now, will you be starting it in the future?

Currently, BMC is not conducting telemedicine. With the availability of latest teleconferencing equipment, provision of cameras in operation theaters, etc. telemedicine is an option BMC is exploring.

Presently BMC is regularly conducting cancer awareness and screening camps and monthly OPD's in Dhamatari and Ambikapur. BMC recognises the importance of early cancer detection and spreading cancer awareness.

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INTERVIEW

'We hope to see more birth centres with the collaborative model of care come up in India'

Dr Vijaya Krishnan, Founder, The Sanctum, Natural Birth Centre speaks in detail about the need for midwife-led maternity care, advantages of natural birth, Sanctum's collaborative model of care and more, in an exclusive interaction with **Lakshmipriya Nair**

Since thousands of years midwives were the 'wise women' who helped other women in their times of pregnancy, childbirth and post delivery stage

You are promoting the concept of midwife-led maternity care. What all does it entail?

Midwife means 'with women'. Since thousands of years midwives were the 'wise women' who helped other women in their times of pregnancy, childbirth and post delivery stage. We even see ancient Egyptian, Indus Valley and Mayan sculptures of women being assisted in childbirth by midwives. Midwives are specialists in normal birth. Skilled midwives are specialists in the 'physiology of labour and Birth', and look at pregnancy and birth as a normal physiological process, in contrast to conventional hospitals and medical system which looks at pregnancy and birth as a medical event, and is tuned to provide 'treatment' for any 'risk' that may occur. Midwives not only provide physical care to expecting mothers, they also offer emotional support, being at their side, 24 hours during labour, encouraging the mother, making her feel confident and supported. Midwives are also skilled at anticipating when things are likely to go wrong, and to call for specialist medical care in case of emergencies. Therefore, midwives are often skilled caregivers, trusted friend, advisors, source of support to mothers, so much that they create lifelong relationships with the women they help give birth.

What drew you to this concept? How did Sanctum come into being?

When we moved back to India from the US in 2004, I was very troubled by the high rates of C-sections in hospitals, and the non-optimal experiences of mothers at the hands of their caregivers. The pendulum had swung so far in favour of hospitals, medical system, protocols, unnecessary tests and procedures, pervasive opaqueness and lack of information, absence of respectful care and so on. I had at the same time got trained in Lamaze childbirth education philosophy, from the US based Lamaze International, which, through education, made would-be parents knowledgeable and confident that women's bodies are tuned to give birth to their babies on their own, without unnecessary interventions. I started teaching Lamaze philosophy of natural birth to to-be parents, and very soon found many people were hungry for such classes and believed they were being denied the chance for natural birth by their hospitals. The classes were a hit - couples learnt unbiased, evidence based information about their pregnancy, their options, truth about various myths about interventions and became very confident. However, they went back into the same system for their birth - one that had an overwhelming majority of caesarean and non-optimal care. The feedback we got from those parents was very heartbreaking. My husband told me that instead of giving up, I should catch the bull by the horns, and offer the 'last mile' to mothers who wanted natural birth. At the same time we met Dr Jayanthi Reddy, a well known Ob/Gyn who was also looking to make a change in her C-section rates. We collaborated to create a natural birth centre, which was led by me and my team of midwives and which cared for mothers under the natural birth focussed midwife model of care. We also had support from Dr Jayanthi's team of OB/Gyns and other medical specialists, in case there was a true medical need. For eight years we refined this collaborative model of care, so much that we were able to achieve a success rate of natural births which is unmatched in any urban hospital across India. We moved to a 10,000 sq feet freestanding birth centre in 2016.

What are the parameters that you check while employing midwives in your set up?

We believe that birth should happen outside the confines of hospitals. In most traditional hospitals we see the mother's wishes are pushed to secondary status and whereas hospital protocols and doctor mandates rule the roost. We, along with most public advocacy organisations in the women's health arena

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INTERVIEW

Totally free cardiac skills training will add to the pool of global talent

With the recently inaugurated Sri Sathya Sai Sanjeevani International Centre in Kharghar, which is going to provide paeditaric cardiac surgery free of cost, Sri Sathya Sai Health and Education Trust will also impart training to ASHA workers to provide the best of treatment to the needy. **C Sreenivas**, Chairman, Sri Sathya Sai Health and Education Trust reveals more in an interaction with **Sanjiv Das**

All services provided in our centres from diagnostics to surgery including accommodation and diet are totally free irrespective of caste, religion, nationality and financial status

Recently, Sri Sathya Sai Sanjeevani Hospital opened a new facility in Kharghar (Navi Mumbai). What is its core objective?
The core objective is to holistically address the national burden of congenital heart disease by providing:
(a) High quality totally free of cost child heart care
(b) Ante natal screening and nutrition programme to reduce MMR, IMR and reduce number of children born with birth defects
(c) Child health screening programme for early detection and timely intervention
(d) Establish training centre for building capacity in paediatric cardiac skills which is scarce in our country.

How huge is India's burden of congenital heart diseases in children? How is Sri Sathya Sai Sanjeevani Centre for Child Heart Care in Navi Mumbai making a dent in this health issue?
As per *Lancet Journal* report, there are 300,000 children born every year in India with congenital heart disease. 25 per cent children die within first year of their birth due to inaccessibility, unaffordability and because they were not detected in time. The prevalence is close to 2.5 crore population living with congenital heart disease in India.

Sanjeevani Centre in Mumbai shall address this challenge by providing totally free high quality child heart care without any discrimination. Through its screening programme in rural areas, it will identify children at the right age and provide timely intervention. By providing totally free cardiac skills training, it will add to the pool of global talent in paediatric cardiac skills who can treat more patients across the world.

How do you pick your cases and ascertain its worthiness? How will you be able to sustain yourself in the long run?
All services provided in our centres from diagnostics to surgery including accommodation and diet are totally free irrespective of caste, religion, nationality and financial status. Majority of the patient families are from economically challenged background. Medical team assesses the urgency of the treatment and schedules the surgeries/interventions accordingly. The quality of work and the selflessness with which it is done, has garnered support from various sections of society in India and abroad, both from government and non-government institutions.

How is technology being implemented to improve the effectiveness and efficacy of your venture?
Our centre will be having a world class cath lab and operation theatres for providing high quality paediatric cardiac care. At Sai Sanjeevani, medical teams feel more empowered to take appropriate decisions for patient care without being bound by economic conditions of the patient. We also have introduced an advanced stethoscope in collaboration with HD Medical from the US, to screen children in rural Maharashtra for congenital heart disease.

There are two centres in Naya Raipur (Chattisgarh) and Palwal (Haryana) which are already operational. In which year were the two hospitals commissioned and how may surgeries are being conducted at both the centres currently?
The centre in Naya Raipur (Chhattisgarh) started in November 2012 and the centre in Palwal (Haryana) started in November 2016. Between these two centres, we perform 300 surgeries/cath interventions every month. From November 2012 to April 2019, we have managed over 80,000 outpatients and performed over 8,850 surgeries/cath interventions totally free of cost. These patients have come from 30 states in India and 10 developing countries.

How much was invested to set up the hospital in Navi Mumbai? What are the

facilities that you offer?
We have invested over Rs 100 crore in the Navi Mumbai hospital. It shall have Department of Cardiology with advanced echo machine and cath lab, cardiac operation theatre, well equipped ICU, wards, canteen and free accommodation for patient attendants, Department of Mother and Child Heart Care for screening pregnant women and children and training centre.

The hospital in Navi Mumbai also houses a training in paediatric cardiac skills for ASHA workers? Is it being done as part of some tie-up with the government?
We shall be providing training to ASHA workers and Anganwadi workers honing their skills in ante natal care and screening children under the guidance of RBSK programme run by the government. Focus shall be to train them in identifying children with congenital heart disease. Government of Maharashtra has signed an MoU with our hospital to recognise us for providing training in paediatric cardiac skills, which is highly technical and much needed skill set to address this cause.

> We shall be providing training to ASHA workers and Anganwadi workers honing their skills in ante natal care and screening children under the guidance of RBSK programme run by the government

Legendary cricketer Sunil Gavaskar pledged to sponsor 34 surgeries. Any other celebrities/renowned figures who have ventured their support to the hospital?
Cricketer Sachin Tendulkar has supported this cause of Sanjeevani and inaugurated India's first paediatric cath lab in Palwal, Haryana centre.

What are your expansion plans and do you plan to open more centres in Maharashtra and other states?
Apart from Navi Mumbai, we are doing mother and child health programme in Yawatmal district. We have plans to open our fourth hospital in eastern part of India.

Does the government subsidise/sponsor any free surgeries?
Our hospitals are empanelled under Ayushman Bharat scheme of Government of India. For the patients who are covered under this scheme, we get reimbursed by the government as per the standard packages. Government of Chhattisgarh under its Chirayu Chhattisgarh scheme supported an operation theatre in our Raipur Hospital and also empanelled us under RBSK scheme. Government of Maharashtra has signed MOU with our hospital recognising us as a centre for child heart care in the state of Maharashtra.

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'We hope to see more birth centres...

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around the world believe midwives can be most effective being independent of hospitals and outside of obstetric-centric environments. Therefore autonomous, or independent midwives have been most successful in achieving best outcomes in maternal health, and in natural births. I look for midwives who are passionate, skilled, and at the same time very good in communication, have the ability to connect emotionally with mothers and families and have the initiative to go beyond the call of duty.

How is Sanctum's delivery model different from a hospital-centric one?
Sanctum's model of care is very different from a hospital-centric one. Perhaps the most important difference is that at The Sanctum, the mother is at the centre of the care universe. We believe the mother is the primary caregiver to her baby, and we are all the supporting cast. We empower the mother and her husband with knowledge, holistic care, 24x7 attention to her physical and emotional needs, and the confidence and trust they develop that they would be able to birth their baby naturally. So the mother feels she has endured the pain and birthed her baby, and not some doctor who has 'delivered' her baby for her. We offer continuity of care, meaning our mothers are cared for right from preconception, through pregnancy, childbirth, post partum care to well women and post menopause care. So that way, the woman has complete familiarity with and trust on her midwife. During labour our caregivers, nurses and duolas are always with the mother, encouraging her and building her confidence. Our midwives watch over her and her baby's health like a hawk, no matter how many hours they have been without sleep or food or rest. It is total dedication to the cause that midwives believe that their's is not a 'profession' but a 'calling'. Our results in the past year have proven the superiority of our collaborative model of care. We are perhaps among only five birth centres in the world who offer this model of care.

Midwife-assisted births used to be common in India. How does the current system of midwife-led maternity care offer significantly more benefits that the model we practiced earlier?
Midwife assisted birth used to be common about 100 years ago. The midwife was an integral part of the 'birth team' when women gave birth. However, their knowledge was not scientifically obtained, rather through word of mouth passed down generations. There was deep wisdom in many of their practices. It is the lack of scientific underpinning behind their practices that forced them to be regulated out of the system. However now, in Scandinavian countries, the UK, Europe and in the US, midwifery as a scientific discipline is very much prevalent. When we brought the practice of scientific midwifery in India, along with it, we brought the science and rigour behind the practice that is prevalent in those countries with best birth outcomes in the world. Midwifery course includes rigorous training in physiology, anatomy, and other relevant disciplines that are required in maternal and newborn care. The current system of midwife-led maternity care at The Sanctum offers the best of all worlds to the mother since along with the natural birth focussed midwifery care, we are able to offer emergency care if required, from our backup medical team.

What are your plans for the next decade and how would you fund them?
We hope to see more birth centres with the collaborative model of care come up in India. We will help them get started and will bring to them our experiences and learnings so that they too can be part of this positive change.

What kind of shift does Sanctum wish to usher into India's maternal health arena?
Our main goal is to make positive change in birth practices in India. We believe birth is a human right. Women have been deprived of their right to be able to decide how to give birth safely and in a manner they want. We want to bring back to mothers this right and empower them with informed decision making for their own birth. We plan to evangelise, build partnerships, influence public policy and take the help of media in spreading this message. We want all our mothers who have given birth at our centre to spread the message of good birth practices and influence their friends and loved ones to be empowered and trust their own bodies to give birth naturally, something that is good for mothers, babies and the future of our society at large.

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INTERVIEW

Vivant taps into groups for whom ensuring their consumers' health is an obligation

In order to make the preventive care movement mainstream and reach out to a larger audience, healthtech start up Vivant adopted a B2B2C strategy for India. **Adrit Raha**, CEO, Vivant explains to **Viveka Roychowdhury** that the platform sublicenses its wellness platform and services to enterprises like insurance, corporates and healthcare providers, which have an obligation to ensure their customer's/employee's health as it has a direct impact on their top line and profitability. With the strategic application of big data, artificial intelligence and cloud-based IT infrastructure, Vivant aims to identify, track and manage an individual's health, promote change in consumer behaviour, thus delaying the onset of NCDs and leading to more effective treatments

What is the business model and value-add proposed by Vivant, which is the re-branded wellness and health analytics platform AllizHealth?

As we are all aware, globally, there is an increasing precedence of non communicable or lifestyle diseases (NCDs). Approximately, 41 million deaths each year are due to NCDs and over 85 per cent of these deaths are premature. The only silver lining in this seemingly insurmountable challenge is that NCDs can be prevented. Through early identification and detection, the onset of such diseases can be delayed if not reversed and also lead to more effective treatments.

> The acquisition of AllizHealth proved to be a great shot. AllizHealth came in with not only a proven product and huge customer base, but also with a wonderful team

This is precisely where Vivant comes in. Through its comprehensive health and wellness platform, Vivant is helping people identify their health risks early and use various resources to track and manage such risks and conditions. From solutions such as health risk assessment to storing/accessing/sharing health information electronically, receiving personalised care messages and connecting with specialists and health coaches, the platform proves to be an effective instrument for individuals to make the right health choices and more significantly, at the right time.

In order to make the preventive care movement mainstream and reach out to a large audience, Vivant follows a very novel business model. Instead of reaching out directly to end consumers, Vivant taps into groups for whom ensuring their consumers' health and wellness is an obligation. Focussing across three core segments: insurance, corporate white and blue collar and healthcare providers, we are getting on to the wellness bandwagon as managing the health of their customers, members and employees have a direct impact on their top line and profitability. Vivant's platform almost acts as an "Intel Inside" for these groups and enables them with the necessary foundation to construct their health and wellness initiatives. Vivant thus pursues a B2B2C model and sublicenses its wellness platform and services to these enterprises.

As a health tech startup, what is Singapore's Wellness Platform (SWP) business plan/strategy for the India market? What has been the response since the buyout of AllizHealth last July? In terms of the kind of partnerships, members signed on, products/services launched, revenues earned, etc.

It wouldn't be farfetched to suggest that in the near future India is going to lead the way with regards to innovations in healthcare. We are already leading the pack when it comes to medical tourism, quality of specialists, low cost diagnostic devices and healthtech start-ups. So even for Vivant, India is and will

continue to play an extremely crucial role. As a shorter term strategy, we are looking to double down and pursue our enterprise licensing model. We are especially bullish on the occupational health space. Given the inefficiencies and inadequacies of the current processes adopted by manufacturing companies when it comes to employees' health, there is a tremendous opportunity to utilise our platform and bring about a change.

The acquisition of AllizHealth proved to be a great shot in the arm for us. AllizHealth came in with not only a proven product and huge customer base, but also with a wonderful team. There was an instant connect and both groups can in with complimentary skillsets. This synergy has helped accelerate our go to market plans and also take several bold steps. We are in the process of setting up a Vivant Innovation Labs to focus on some cutting edge innovations ranging from voice enabled apps, AI/ML powered data analysis to fall detection and prevention wearables. To showcase our diligence towards women health issues, we are recently launching our comprehensive period and fertility tracker app. Post buyout, we have onboarded several leading enterprise partners such as Star Health Insurance, Chola MS GI, Hero Motocorp and over 100,000 end customers. We are now furthering our presence in SE Asia and MENA regions as well.

How does Vivant intend to deal with the fragmented healthcare ecosystem across hospitals, chemists/ pharmacists, insurance companies as payers and patient/customers?

With our platform; services and approach, we are quite uniquely positioned to cater to the various stakeholders in the healthcare ecosystem. While an insurance provider can use our platform for early identification and management of health issues of their members, a healthcare provider can utilise it in the form of health CRM and upsell/cross services and a patient/customer can use it to manage their health and change health behaviours. Having said that, each of these stakeholders have their own nuanced requirements and there is still a lot that Vivant needs to achieve in order to provide a seamless experience to its users and ensure effective interoperability of health information.

Vivant is building a network of ecosystem partners with over 4000+ such partners

As a start, Vivant is building a network of ecosystem partners with over 4000+ such partners. From diagnostic chains to fitness and day care canters, telemedicine partners, home health providers, online and offline pharmacy partners, it is providing an architecture which almost acts as a sales channel for other companies. We realise we cannot be a pioneer in everything and strategy is to partner with such groups who are providing such niche services. This has a dual benefit as a) it helps our consumers with the best services/solutions available and, b) gives us a chance to build a tightly coupled interface with our ecosystem partners. This in turn enables seamless exchange of information. The more our ecosystem partners grows, the more we are able to address the challenge from a fragmented ecosystem, at least for our consumers.

Traditional stakeholders in the healthcare sector (doctors, hospital administrators, chemists/pharmacists) in India as well as other countries have been resisting digital health initiatives. Each stakeholder has a different reason, How is Vivant planning to address these issues?

It is a misconception that healthcare stakeholders are indifferent to digital health initiatives. Yes, it is true to some extent that many of them prefer status quo and resist any change but it stems from the fact that digital health initiatives often lack the level of intuitiveness required attract these stakeholders. Same time, many of these initiatives are copycat models from other industries, be it ecommerce or fintech etc. Such initiatives fail to consider that healthcare is a very need driven industry where the interests of each stakeholder needs to be accounted for and protected.

The way Vivant is trying to go about it is by carefully considering how its platform and initiatives are going to impact each and every stakeholder. As an example its period and fertility tracker needs to consider the personalised needs of every female, then the data and metrics which might make sense to her gynaecologist and lastly, what would her insurer be interested in tracking. So, for us a successful app would be one, which takes into account the interests of all the three groups involved above and let them have a skin in the game. We realise that this is not a build things, break things industry and one cannot rearrange just one piece of the puzzle without touching others.

How will patient data be protected?

Patient/consumer health data is sacrosanct to us and there is zero tolerance policy when it comes to ensuring security of data, both, while in transit and at rest. Vivant has been a strategic partner of Microsoft for few years now and is part of its Biz Spark+ programme for start-ups. We use Microsoft Azure cloud platform for hosting and storing our data. As a result, we do have a ringside view of the stringent protocols Microsoft follows to ensure security and safety of data. They do run frequent VAPT's and share reports with us on system vulnerabilities and loopholes which we need to close. Apart from this, Vivant does frequent third party data safety and security audits and also access control audits. Our platform uses some of the latest encryption methodologies and security protocols. Though bit of a moon shot at this stage, we are also considering moving on to blockchain which would further guarantee data protection.

What is the cost of the services being offered by Vivant?

Our enterprise licensing models come in different flavours. We have a model where we charge an initial upfront fee to handle changes to UI/UX, customisations, integrations and other changes. Post that we charge our clients a per user, per annum fee. This model works particularly well with our Insurance partners as there is shared risk and with both groups having a skin in the game and an incentive to drive usage and engagement. With our corporate partners, we typically follow a per annum subscription fees model and is independent of the number of employees utilising the platform (SAS model).

Apart from the licensing fees as mentioned before, Vivant offers number of value added services such as medical second opinion, discounted health check-ups, online pharmacy and condition management programs. Such services are "pay per use" services and paid for directly by end customers. The costs here could vary depending on the service opted.

How is Vivant funded?

We have had a fairly impressive growth trajectory so far and run an extremely tight ship so fortunately our need for external funding is limited. Frugality is at the core and essence of how we do innovation. While our customers have been fuelling our journey so far, we are definitely interested in getting an external investor onboard. We have pretty aggressive expansion plans not just with respect to our product portfolio, but also in terms of geographies and industries covered. To achieve this objective, we are looking for a strategic partner with access to capital and network. Securing an external round of funds would also work almost as stamp of approval on our venture and future plans.

Where does Vivant's Advisory Board fit into the equation?

No start-up reaches success alone. Even when we have moved beyond the idea stage and have a full-fledged company, we do need to rely on outside expertise to keep the organisation flourishing. This is where an advisory board comes in. The board helps us in bouncing ideas, keeps us on our toes, prevents us from getting complacent and brings in a fresh and outside the box perspective. Vivant's board of advisors have been handpicked and are among the finest in their fields. The board comprises of experts from insurance broking and health and wellness space to medical experts and healthtech entrepreneurs. The diverse board helps us develop solutions which are more holistic and inclusive. Some of the names that Vivant has onboard are Dr David Kaplan, senior partner and founder of Mercer LABS; Dr Seemanthini Desai, clinical leader and authority in infection control;

Sonali Shivlani, internationally certified pregnancy, lactation and child nutrition counsellor and Shweta Rastogi, clinical dietician with more than 15 years of experience.

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INTERVIEW

iCreate has established partnerships with 31 institutions

As India witnesses a surge of healthcare startups offering innovative services both to patients and healthcare providers, startup incubators are focussing on coaching innovators to not only develop products that solve healthcare gaps but also train them to raise growth capital. iCreate is one such institute that aspires to be a force to reckon with for entrepreneurship in the healthcare space. **Anupam Jalote**, CEO, iCreate shares his strategy and vision with **Raelene Kambli**

What was the founding vision of iCreate, and how is it being realised ?
iCreate is an autonomous centre, founded by the then CM of Gujarat, Narendra Modi.

It has been set up for the sole purpose of promoting and facilitating enterprise. The way IIT is well known for engineering and IIM for management, iCreate aspires to be a force to reckon with for entrepreneurship.

iCreate is much more than an incubator or an institution. At iCreate, an innovator can come in with an idea, and receive technical help, labs and space and money with which to create a prototype. Those with prototypes are helped with visualising and understanding their customers and creating marketing penetrating strategies as well as high growth business plans. They are then encouraged to revenue generation and raising growth capital.

iCreate supports idea to prototype, prototype to proof of concept, and then onwards to market penetration and commercial scale up. It is sector-agnostic, but its thrust areas are emerging tech: AI, ML, IoT, absorption spectrometry, robotics, EVs, energy storage, agri-tech, FinTech etc. to solve the developmental needs of India.

Not being an academic institute is a powerful strength of iCreate – enabling it to collaborate with the best knowledge workers in the world, and therefore attract bright talent from all over the country and outside, to create tech innovation driven solutions that help take India forward.

Over the past five years of its existence, iCreate has been able to create an enviable track record of creating successful startups that have already entered the market, are generating revenue, employing people and raising growth capital from angel investors as well as venture capitalists.

Where do you see the healthcare startup culture moving in the next 5-10 years?
There are many different directions that tech innovators in the healthcare space are taking. At iCreate we are focussing on devices for early disease detection. More specifically on the use of absorption spectroscopy on various bodily fluids by low cost handheld devices that can give warning of early onset of several diseases.

This will enable a wide spread of diagnostics facilities into rural and peri-urban areas that currently are underserved and it also allows for very wide spread data capture that will enable better informed decision making by the health care professionals and policy makers.

Many startups are already working on products that are able to map early detection of diseases, we could definitely need more such innovations. We are also seeing some unique innovations within the space of ayurveda, prosthetics, gene therapy and related areas.I believe, that the rise in healthcare tech will also result in pharma and healthcare companies loosening their purse strings to encourage more activities within R&D, innovations and prototyping so that India can give new devices and solutions to the world, rather than taking.

> iCreate has been set up for the sole purpose of promoting and facilitating enterprise

We can safely assume that the next 5-10 years will see an accelerated growth towards newer healthcare initiatives.

What are the key challenges faced by healthcare startups in India and how would you bridge the gap?
Within the healthcare sector specifically, startups are challenged by the large fragmented population of the country. Medical records are very often scattered and this makes it very difficult to understand and record a patient's medical history.

The long developmental cycles means that in this space, it takes a lot of time, effort and money to develop new products, and precisely due to this reason, early stage funding is not easy to attract.

For many startups, just the cost involved may deter them from innovating.

One constant challenge seen – be it within the healthcare sector or any other sector is the lack of business fundamentals. While they may be excellent innovators, many of them falter when it comes to customer orientation and the basics of running a successful business. This often leads to businesses not scaling sustainably.

Many startups also falter as they do not have access to guides or mentors or experienced healthcare professionals who can expose novice entrepreneurs to newer avenues, ideas and approaches of tacking a certain situation.

iCreate realises these gaps and aims to bridge these gaps by offering incubation wherein startups have access to world class infrastructure, state-of-the-art equipment to help further their innovations, access to well-known industry experts within the healthcare and the medical, access to investors who can help address funding requirements.

With access to industry leaders, academicians, investors and seasoned entrepreneurs, startups can discuss challenges faced on a case to case basis and accordingly find solutions to address these challenges.

To address these challenges, at a broader macro level, companies need to mobilise their CSR spends on driving research, innovations and prototyping wherein startups are more encouraged to innovate. We must work towards awareness and confidence building amongst startups that they are not alone in their journey and they have access to some of India's brightest minds in the healthcare space.

Looking more broadly, what are the biggest opportunities and obstacles you see for

innovation in the Indian healthcare environment?
We have a very strong base of tech innovators that is comfortable with both hardware as well as software – and it is the combination of both, along with Big Data Analytics that is the need of the hour in driving new innovations in this space.

That will allow us to leverage another big strength – our huge demand base – the population of India.

For any company in the healthcare sector, India's market size is a huge opportunity. The population's demand for accessible, affordable, effective and safe healthcare environment is higher than many other countries thus offering any startup a huge audience base.

The other opportunity for startups is the rapid pace at which technology is developing. If companies are able to synergise their solutions with emerging technology such as Blockchain, IoT, ML, AI, many challenges within the sector could be addressed thus widening the opportunity for Indian healthcare startups to flourish.

How important it is to come up with a blueprint that encourages research and innovation in healthcare? What partnerships do you have with academic and research institutions in this regard?
One of our biggest strengths is the fact that we are not an academic institution, and therefore we are open to partnering with innovators across the globe. That is why, over the past years, iCreate has established partnerships with 31 institutions such as leading technology companies, industry body associations, investors, international universities and academic institutions and other incubators.

Some of our partnerships include with companies and organisations like Cisco, US India Strategic Partnership Forum (USISPF), Invest India, Pears Program for Global Innovation, Piramal Sarvajal, Dassult Systems Solid Works Corporation, FICCI, University Houston(UH) ,Texas, BootUP Ventures, Impact Centre, University of Toronto, iNDEXTb Aqwise, Biofeed, IIT Gandhinagar, Centre for Innovation Incubation and Entrepreneurship (CIIE), Technion, Gujarat Technological University(GTU), Gujarat Mineral Development Corporation (GMDC), GVFL (formerly Gujarat Venture Finance Limited), Central Institute of Plastics Engineering and Technology, Ranchi (CIPET RanchiYoung Indians(Yi) amongst others.

One of our biggest strengths is the fact that we are not an academic institution, and therefore we are open to partnering with innovators across the globe. That is why, over the past years, iCreate has established partnerships with 31 institutions such as leading technology companies, industry body associations, investors, international universities and academic institutions and other incubators

How is the entrepreneurial culture at iCreate different from others?
When you set up an institute to be the IIT / IIM for startups, the levers that drive it forward also become different.

This is an institute that is in no hurry to 'just do numbers' and demonstrate throughout. We do the hard work and heavy lifting needed to support and nurture a project till it becomes a successful revenue and profit generating organisation. That is why we have a 'High Touch' model – we spend a lot of time supporting projects, and continue to support them even after they have spun off and are out in the open market.

At iCreate, we offer entrepreneurs a blend of creativity, innovation, engineering, product design and leverages emerging technologies to develop out-of-the-box applications.

We handhold our projects in areas such as prototyping, market access, go-to-market strategy, funding, operations etc. At the same time, our projects also have access to industry leaders, investors, academicians, government, researchers who can advise them on various aspects of building a business.

Entrepreneurs at the iCreate campus have access to fully furnished office rooms, classrooms, a 500 seater auditorium and two seminar halls, conference rooms for board meetings, meeting rooms for brainstorming sessions, laboratories with state-of-the-art equipment, Student Idea Lab and project rooms.With these offerings and infrastructure facilities, the centre aims to seed a new ethos wherein people will understand and encourage entrepreneurship as a preferred career option.

Which healthcare startups have graduated from iCreate so far?
While there are several very exciting projects that are being incubated at iCreate, let me share with you details of three of our healthcare startups.

Founded by Shilpa Malik, Bioscan Research has developed a hand-held scanner that can detect and pinpoint the location of a haemorrhage in just two minutes. Their innovation is a low cost, medical device for early detection of intracranial bleeding to save lives and screening in the fastest way.

The product is a non-invasive screening tool for quick on-site scan that minimises the loss of waiting time. Early detection of traumatic brain injury (TBI) directly and/or indirectly can save more than two million people in India, who are caused by accidents, falls, violence, or natural calamities. Several investment organisations have recognised Bioscan's efforts and the company has won several awards such as the Indo-Israel Innovation Challenge, Starhealth 2017, Lufthansa Runway to Success, Lufthansa Runway to Success Top 4 startups, AICTE Canada India Accelerator Program, Qualcomm Design Challenge, Top 47 Product Innovations in Design Impact Awards amongst many others.

Our other project, Purple Docs founded by Deepak Gupta is a health record management company that digitally preserves vital records which are retrievable within few seconds. A cloud-based software solution that is user friendly, saves time and simple to use. One can easily access records, scans, MRI, X-rays, reports, from anywhere and reduces operating expenses. PurpleDocs safeguards all the physical and electronic records related to hospital operations, patient records etc. It also helps comply with the MCI rule that says that the patient record needs to be reserved for up to seven years and a hospital should be able to produce it within 72 hours if the patient demands, hence minimising litigation risks of the hospitals.

Founded by Abhin Kumar and Cameron Norris, Social Hardware is designing a low cost, fully-functioning, life-like prosthetics for amputees from low-income and rural communities. Their aim is to maximise the product lifespan for amputees from low-income and rural communities. Their products are made of silicone rubber prosthetic hands that are UV, dust, stain, and water resistant. Social Hardware has been successfully competing in many competitions including Enable Makeathon Finalist 2015; Top 3000 smart fifty solution – 2018; CII-Healthcare and medical sector finalist presenters - 2018 and Design Impact awards top 49 2018. To ensure that amputees receive the necessary support they need, Social Hardware has also set up disability rehabilitation programmes with The Association of People with Disabilities and Jaipur Foot to provide amputees from rural communities with access to the physiotherapy and training required to effectively utilise a prosthetic hand in daily life.

What kinds of IP are being created by your healthcare startups?
From our healthcare startups cohort, our projects Bioscan and Social Hardware have IPs that are being created and have been filed for.

What are your recommendations for Indian policymakers to make business easier for incubators, accelerators, investors, researchers, and startups in India?
There has been a very strong momentum built up in the innovation and startup space in the recent years. This is reflected by not only the quality but also the quantity of applicants.

However, there is still a huge, unmet need for median funding to be given – in the Rs 30 to Rs 75 lakh band, for pre-revenue starts as money to support early market penetration and growth. This money is very hard to come by, and is in our opinion the single factor that will have the largest positive impact on the number of successful innovations entering the Indian market.

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Building a culture of excellence

Nilaya Varma, Partner and Leader, Markets Enablement, KPMG in India, shares tips on how healthcare organisations can build and sustain continuous improvement by following certain core values

It should not come as a surprise to anyone working in the healthcare space, that the way staff feel and care about their workplace, has a direct bearing on the quality of patient care, as well as on the go efficiency and performance of an organisation. Healthcare providers internationally, today are faced with numerous challenges which include increasing staff engagement, difficulty in driving improvement, ongoing cost containment and communicating their organisational objectives.

So what is the need of the hour?

The answer to this is continuous improvement, which is imperative to address the mentioned obstacles by fostering a systematic and sustainable approach to enhanced quality of care and in turn better outcome for patients. An organisation's wide approach to continuous improvement principles engages a frontline staff and embeds a scalable methodology for coordinating improvement activities. The challenge here is to understand how to lead the implementation of continuous improvement tenets sustainably and successfully across large scale and complex healthcare organisations, to deliver the benefits it can provide. This can be even more challenging in a country like India, where in the past few years have authorities intensified efforts to focus on health programmes to provide good healthcare to every citizen of India. The recently launched programme to achieve the target of universal health coverage, is a step in the right direction. In India specifically, just improving access to healthcare may not ensure better outcomes. The aim for healthcare organisations here, must be to ensure sustainable continuous improvement, with the objective of improving access, quality of care and achieving operational excellence.

> The aim for healthcare organisations here, must be to ensure sustainable continuous improvement, with the objective of improving access, quality of care and achieving operational excellence

So how have healthcare organisations globally achieved this improvement?

KPMG International's report-Creating a Culture of Excellence, lists out some foundational truths that are essential for those looking to take their healthcare organisations on an improvement journey and seeking to sustain and scale it.

Let's dive deep into some of these truths.

Globally healthcare organisations are creating end to end management systems which are not just limited to being a process improvement team. They use status sheet exchanges, structured problem solving, unit leadership teams etc. to aid in bringing improvements, so they can go a long way in having a tangible and positive financial impact. If you get the quality right, then the money follows.

Secondly they are working towards getting senior leader's commitment to change themselves, not just others, meaning having a sense of purpose, scientific thinking, ensuring quality at source and transparency through visual management. This essentially means, they are working towards reducing waiting times for patients by a long mile which is key

Thirdly they look at continuous improvement from three aspects - balance, planning and doing it over a multi-year journey, which is resulting in improved quality and good clinical engagement with successful communication.

Fourthly, healthcare organisations abroad are constantly committed to finding new ways of working. Though this can become difficult, unsettling, and even threatening for some, the importance of anticipating these potential obstacles and engaging with staff is important. When this is done, the staff become champions to drive implementation forward; when it is done poorly, the resulting lack of staff engagement could cause the programme to falter, without even delivering the desired patient, staff and organisational benefits.

Fifth and in my opinion most important is healthcare organisations abroad are today aligning their organisation to deliver their 'True North' – which means ensuring that improvement work on the shop floor reflects the overall strategy. The handful of metrics which represent the goals an organisation is targeting are often referred to as the'True North': the true direction in which the organisation should be travelling. Achieving this even to a certain extent, has seen many of these organisations achieve success by offering patients' good quality care and safety, which means zero harm, family centered care and hundred person engagement.

So what can Indian healthcare organisations learn from such successes?

India has an elaborative health care delivery system but the system is not able to deliver quality. This is true for organisations both public and private in the country. Some of the successes highlighted, showcases great potential for continuous improvement approaches in healthcare in India. Healthcare organisations in India should look at inculcating a complete and long term commitment within the organisation so as to ensure sustainability and end the vicious cycle of short-term gains followed by a relapse into old ways.

What is required in a country like India is placing emphasis on making improvement a mandatory part of everyone's daily work as opposed to focusing on a set of specific projects. Healthcare organisations and their leaders should look at supporting staff with on-the-job coaching so as to provide them with the skills and confidence to challenge the status quo.

Continuous improvement could result in the traditional 'cost versus quality' argument redundant as effective clinical efficiency and quality of patient care, both public and private institutions can reduce costs.

Lastly achieving operational excellence through the implementation of a culture of continuous improvement is both a challenge and an opportunity for healthcare leaders today. Therefore, the journey should be viewed as an enabler to channelise the ideas of healthcare professionals into practical solutions that meet the 21st century challenge to permanently raise quality and reduce costs over decades.

AI – What should radiologists know?

AI in radiology has demonstrated remarkable improvements, especially in image-recognition tasks, data integration, reducing errors, indentifying patterns and abstractions, which are not visible to the human eye and more. However, there are still many Indian radiologists who fail to understand its clinical implementations and provide perspective on how this domain can be further advanced. Some even dread that AI will takeaway their jobs and make them redundant. Nevertheless, the debate continues but with hope that radiologists will finally break barriers of perceptions and look beyond job securities to explore AI in its varied forms to evolve and improve the practice of radiology

AI in healthcare: Artificial or Augmented Intelligence choice is yours!

The field of medicine is currently witnessing a major paradigm shift in the design principles of many computer-based tools that are being used in the clinic. There is great debate about the speed with which newer deep learning methods will be implemented in clinical healthcare practice with speculations for the time needed to fully automate clinical tasks ranging from a few years to decades. Regardless of whether machine- or human-based aids are leveraged, healthcare needs such aids. Improving performance has become vital to its future.

Artificial intelligence (AI), particularly deep learning algorithms, have demonstrated remarkable success in the field of healthcare and image-recognition tasks. Healthcare practice historically has been dependent on trained physicians who visually assess the medical images for detection, characterisation and monitoring of diseases. At the same time there is a relative paucity of trained expert physicians compared to the patient density and the disease burden in our country. We believe, AI has the potential to bridge this gap to a large extent. In the current era of AI, there is a paradigm shift where AI methods have the potential to automatically recognising complex patterns

Dr Abhishek Mahajan,
Associate Professor, Radiology

in imaging data and provide quantitative, rather than qualitative, assessments of radiographic characteristics. With seamless integration of the AI component within the healthcare workflow, there is great potential to increase efficiency, reduce errors and turnaround-times by automating the mundane repetitive tasks which the physicians perform. Rather, their expertise can be augmented and supplemented by providing trained radiologists and pathologists with pre-screened images and identified features, enhancing their work outputs. Hence, considerable efforts need to be put to plan and strategically design, allocate funds and implement the technological advances related to AI in medical imaging. Almost all image-based healthcare tasks are dependent upon the quantification and assessment of radiographic and pathologic characteristics from their images.

The adoption of AI in the healthcare sector especially in the public sector, can have far-reaching implications in terms of augmenting accessibility to healthcare services through early detection, diagnostic, decision making, treatment planning and monitoring, and is expected to see an exponential increase in the next few years. It has the potential to augment

the care physicians and other healthcare workers provide and should be seen as 'Augmented and Assistive Intelligence' rather than 'Alternative Intelligence'. The time is ripe for developing countries like India to join the race to lead the AI revolution, which is still in the making. Strategic positioning, ethical considerations and joint public private sector collaborations will ensure smooth transition and implementation of AI in healthcare especially healthcare.

Recognising the potential of AI to transform India's economy, the Government of India authorised 'NITI (National Institution for transforming India) Aayog' to address the national strategy on artificial intelligence and other emerging technologies. In pursuit of the above, NITI Aayog has collaborated with several leading AI technology companies to implement AI projects in critical areas such as agriculture and health. AI-based Radiomics project supported by NITI Aayog in collaboration with Tata Memorial Centre Imaging Biobank (figure 1): (Machine learning and Artificial Intelligence Database (MAD), Tumor Radiomics Atlas Project (TRAP) for Cancer and Human Cancer Pathology Atlas) is currently underway under the leadership of Dr Sudeep Gupta with principal investigators being Dr Abhishek Mahajan, Associate Professor, Radiology and Dr Swapnil Rane, Assistant Professor, Pathology. This project will allow the generation of imaging biomarkers for use in research studies, support biological validation of existing and novel imaging biomarkers and in the long run, provide an unprecedented opportunity to improve decision-support in cancer treatment at low cost.

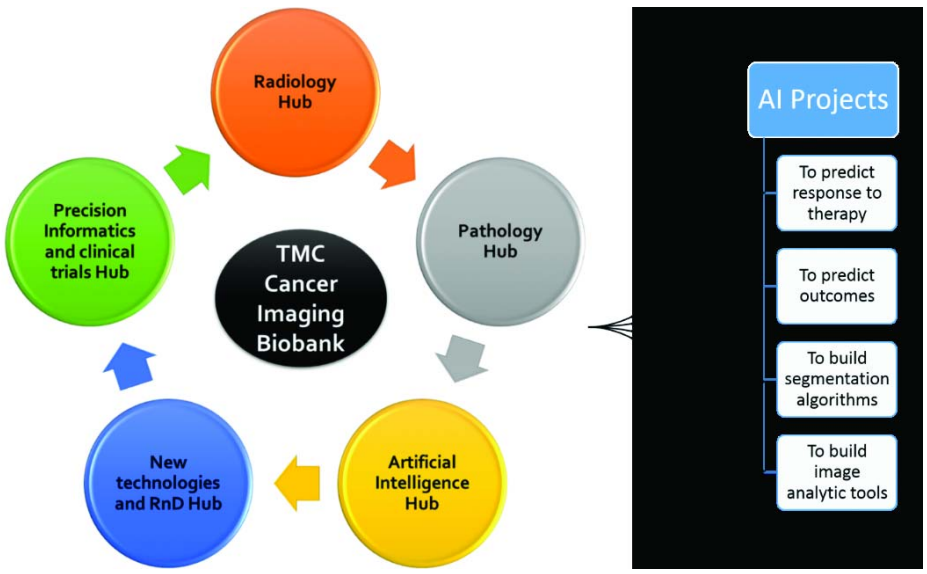


Figure 1: Tata Memorial Centre Imaging Biobank Project

The TMC Imaging Biobank for Cancer will be one of the most ambitious and exciting health research opportunities in recent years for TMC in collaboration with GoI and will provide wide range of opportunities across the nation. It will provide an unprecedented level of information to help scientists and oncologist working on cancer biology to develop and validate AI algorithms. This will be an organised database of medical images and associated imaging biomarkers (healthcare and beyond) shared among researchers within and outside the country and linked to other bioreposi-tories.

AI has great potential to enable better cancer care

Using AI to analyse tumours and uncover biomarkers Radiomics is an area of medical study that aims to extract large amounts of quantitative features from medical images using algorithms to analyse and characterise data. Using new technologies and artificial intelligence (AI), this field is undergoing rapid change as the potential to uncover disease characteristics (biomarkers) that traditional analysis of scans are often unable to identify, is being developed. When a radiologist looks at the image of a tumour on a CT or MRI scan they can see the shape, outline and position of the cancer, while the computer creating the image sees a large number of individual pixels, each with a different density. New algorithms and AI are being developed which can use this data to analyse tumours on a region by region basis, generating more information for the clinician to help them understand the nature of the disease.

One of these tools, TexRAD is an algorithm used as a research tool by more than 60 prolific university hospitals and imaging centres across the world to compare patterns of pixel density to produce information on the texture of the tissue. The system uncovers potential radiological biomarkers in medical images that are typically not visible to the naked eye, providing significant additional information which may assist discussions about treatment regimes. As tissue structure is altered by disease, especially by cancer, biomarkers which reliably measure this could be extremely valuable. When an abnormality is seen on a scan, the TexRAD examination of the mass may identify differences between benign and malignant lesions, potentially helping in diagnosis. Published research (100+ in peer-reviewed journals and conferences) has shown that the technology may identify tissue changes such as fibrosis, which can put patients at risk of malignancy. Going one step further, there is also a growing body of data suggesting that cancers with specific patterns may be associated with a better or worse response to different treatments.

Dr Balaji Ganeshan, Founder and Chief-Scientist, TexRAD Global Business Development, Director, Feedback Medical

> The system uncovers potential radiological biomarkers in medical images that are typically not visible to the naked eye, providing significant additional information which may assist discussions about treatment regimes

To maximise the benefit of AI based analysis, a suitable Picture Archiving and Communication System (PACS) is needed. Over the last 15 years, PACS has become the bedrock of medical imaging storage and management, with the need to capture the ever-growing number of digital images being accessed worldwide. In institutions where research is planned, a number of specific additional functions are necessary, such as the ability to link easily with other systems and, crucially, software able to anonymise data and ensure patient confidentiality.

Radiologists must act more as clinicians

Artificial Intelligence (AI) is the most promising area of health innovation in medical imaging. AI may find multiple applications, from image acquisition and processing to aided reporting, follow-up planning, data storage, data mining and many others.

AI is patterned after the brain's neural networks. It uses multiple layers of non-linear processing units to 'teach' itself how to understand data classifying the record or making predictions.

What are the challenges of using artificial intelligence?

The principle limitation of AI is that it learns from the data. If any data is inappropriate then it has limitations.

How AI works in imaging?

The increasing amount of imaging data to be processed can influence how radiologists interpret images: from inference to merely detection and description. When too much time is taken for image analysis

- Machine learning uses methods from neural networks, statistics, operations research and physics
- A neural network is a type of machine learning that is made up of interconnected units (like neurons) that processes information by responding to external inputs, relaying information between each unit.
- Deep learning uses huge neural networks with many layers of processing units, taking advantage of advances in computing power and improved training techniques to learn complex patterns in large amounts of data.
- Cognitive computing is a subfield of AI that strives for a natural, human-like interaction with machines.
- Computer vision relies on pattern recognition and deep learning to recognise what's in a picture or video.
- Natural language processing (NLP) is the ability of computers to analyse, understand and generate human language, including speech.
- Graphical processing units provide the heavy compute power that's required for iterative processing. Training neural networks requires big data plus compute power.
- The Internet of Things generates massive amounts of data from connected devices, most of it unanalysed.
- Advanced algorithms are being developed and combined in new ways to analyse more data faster and at multiple levels.
- APIs, or application processing interfaces, are portable packages of code that make it possible to add AI functionality to existing products and software packages.

Dr Sikandar Shaikh, Consultant PET-CT & Radiology, Yashoda Hospitals, Hyderabad, Asst Prof Shadan Medical College Hyderabad and Adjunct Asst Prof ,Dept of Biomedical Engg. IIT Hyderabad

AI applications may enhance the reproducibility of technical protocols, improving image quality and decreasing radiation dose, decreasing MRI scanner time and optimising staffing and CT/MRI scanner utilisation, thereby reducing costs. The quicker and standardised detection of image findings has the potential to shorten reporting time and to create automated sections of reports. The reasonable doubt is that we are now facing methods that not only cover the production of medical images but also involve detection and characterisation, properly entering the diagnostic process. Indeed, this is a new challenge, but also an additional value of AI. The high number of examinations to be reported and rather focus on communication with patients and interaction with colleagues in multi-disciplinary teams.

Following are the immediate impacts of AI in Imaging

- Prioritisation of reporting
- Comparison of current and previous examinations
- Quick identification of negative studies
- Aggregation of electronic medical records
- Automatic recall and rescheduling of patients
- Immediate use of clinical decision support systems for ordering, interpreting, and defining further patient management
- Internal peer-review of reports
- Tracking of residents' training
- Quality control of technologists' performance and tracked communication between radiologists and technologists.
- Data mining regarding relevant issues, including radiation dose

The other possibilities with AI are

- Anticipation of the diagnosis of cancerous lesions in oncologic patients using texture analysis and other advanced approaches
- Prediction of treatment response to therapies for tumours, such as intra-arterial treatment for Hepatocellular carcinoma
- Evaluation of the biological relevance of borderline cases
- Estimation of functional parameters, such as the fractional flow reserve from CT coronary angiography using deep learning
- Detection of perfusion defects and ischemia, for example in the case of myocardial stress perfusion defects and induced ischemia
- Segmentation and shape modelling, such as brain tumour segmentation or, more generally, brain structure segmentation
- Reducing diffusion MRI data processing to a single optimised step, for example making microstructure prediction on a voxel.

Radiologists must act more as clinicians, applying their clinical knowledge in answering diagnostic questions and guiding decision-making, which represent their main tasks. They should keep their human control in the loop, considering clinical, personal and societal contexts in ways that AI alone is not able to do.

Hence, an updated radiologist should be aware of the basic principles of ML/DL systems for managing this systems and can play a leading role in this oncoming change.

AI will NOT replace radiologists

The recent developments and news articles around applications of AI in radiology can be summarised in one statement 'Hype kills value.' Last year at RSNA, I had the honour of delivering a talk on 'The mirage of AI Substituting Radiologists.' Six months later, there are at least a dozen radiology AI applications with CE approval and half a dozen with FDA approval. But practically no one is using them. AI enthusiasts might say these are early times. Starting from the inventor of Deep Learning, Professor Geoffrey Hinton, when he infamously compared radiologists to a 'coyote that had stepped over the cliff' to the recent headline grabbing articles that cry 'AI beats radiologist', all of them are doing a great disservice to the revolutionary Deep Learning (DL) methodology.

Claim 1: Error rates in radiology will be reduced

The average error rate in radiology reports range anywhere from 20 to 30 per cent.

Dr Vasantha Venugopal, Imaging Lead, Caring, Mahajan Imaging, analyse on the claims from AI developers that threaten to replace radiologist

Leonard Berlin has published extensively on this issue and cites a real-time day-to-day radiologist error rate averaging 3–5 per cent, and a retrospective error rate among radiologic studies averaging 30 per cent. The average performance of the AI algorithms reported in literature range on the higher side of 90 per cent. So even if the AI misses some findings, it will still be better than radiologists. The big assumption here is the errors made by AI will be comparable to Radiologists. The problem with this assumption is two-fold. The errors made by radiologists are predictable with certain patterns attributable to reasons like fatigue, lack of expertise, distractions or practice biases. These errors are hence preventable by appropriate interventions whereas the errors made by AI systems are not predictable, due to their inherent black box nature and hence can't be prevented by planned interventions. Till the time reliable mechanisms to explain the functioning of

these algorithms are developed, this unpredictability will create a need for radiologists who monitor these algorithms.

Claim 2: AI can see patterns and abstractions not evident to humans

The overarching theme of deep learning has been its ability to decipher representations from data and derive abstractions to an extent not possible for humans. This applies more so to images with innumerable inherent contrasts. The raw data that are acquired at the scanner level, whether sinogram data or k-space data, are broken down, in some form, simplified and made readable by radiologists. In that process, there is loss of large amount of information. Now scientists including engineers from our team are working on ways to apply DL on the raw data. Any reproducible success in that front which seems more possible now than a couple of years back will make radiology, more of a field of data analytics. But till the point that such abstractions still need to be understood by human surgeons and physicians to treat the patients, radiologists will be needed to be that bridge between imaging data and physicians.

Claim 3. AI assistant will enable one radiologist to do the reads done by many radiologists now.

One more prevalent argument is that AI will empower and augment radiologists enabling them to read 500 scans instead of 50 every day. One radiologist will be doing the job of ten radiologists and nine radiologists would have been replaced by our AI assistant. The fundamental flaw in this argument is the lack of understanding of ever-increasing demand for health care services. With increasing awareness among masses and penetration of insurance coverage, more people are getting covered by screening and diagnostic imaging services there is an exponential increase in demand for trained radiologists which can only be partly met by AI if at all it delivers. The analogy here would be of pathology and lab medicine. Almost all of biochemistry and lab tests are fully automated, where you put in serum, and get out the report – has that led to a reduction in the need for pathologists? The lab industry has grown exponentially enabling patients to access these services across geographies at fraction of the cost!

The final barrier that AI will never be able to cross to replace radiologists is professional and legal liability. As things are today, developers of AI will never commit to taking responsibility for the performance of their algorithms since they realise that most radiological diagnoses are arrived after considering the clinical background and assimilating the clinical information which is a unique skill of radiologists that no machine will ever be able to replicate.

AI will replace radiologists

Any discussion around replacement of any 'profession' requires detailed analysis into what the professional entails, and what tasks the professional performs. Only once this list of 'sub-tasks' is created, would it be possible to develop an objective opinion about the potential 'replacement' of a profession.

Radiologists today, broadly, perform the following three tasks – taking measurements and identifying abnormalities on imaging scans, drawing inferences from these abnormalities about the possible pathologies and diseases that patients might be suffering from, and most importantly, communication and clarification of these results with patients and fellow clinicians. From a cognition standpoint, the three tasks have an increasing cognitive need, and hence are that much more difficult for a machine to perform. That is, until Deep Learning came into being. Deep Learning is a new machine learning technique that enables very powerful computers to automatically draw inferences about patterns and relationships from a dataset without having to be 'programmed' explicitly by humans. For example, let's say we want to develop a Deep Learning algorithm to automatically detect pleural effusion on Chest X-Ray. Using traditional machine learning methods would involve defining what a pleural effusion looks like on an X-Ray and trying to 'teach' the machine. With Deep Learning, if you have enough examples (say 10s of thousands) of X-Rays with and without pleural effusion, the machine should be able to learn itself, without us having to define the features of pleural effusion. This is the true power of AI today – when machines can learn themselves, and therefore I believe, that most of the tasks that radiologists perform can be automated and done by machines.

Today, technology exists where anyone can develop automated measuring and segmenting tools. Nvidia, the company that makes hardware on which all AI is developed, has developed a toolkit called CLARA using which computers can be trained how to segment various body parts. Similarly, on the actual diagnosis front, there are innumerable papers that claim AI performance, which is superior to radiologists, simply because there is so much inter-reader disagreement between radiologists. Notable examples include Chest X-Ray, Chest CT and Head CT. In fact, we have also seen that

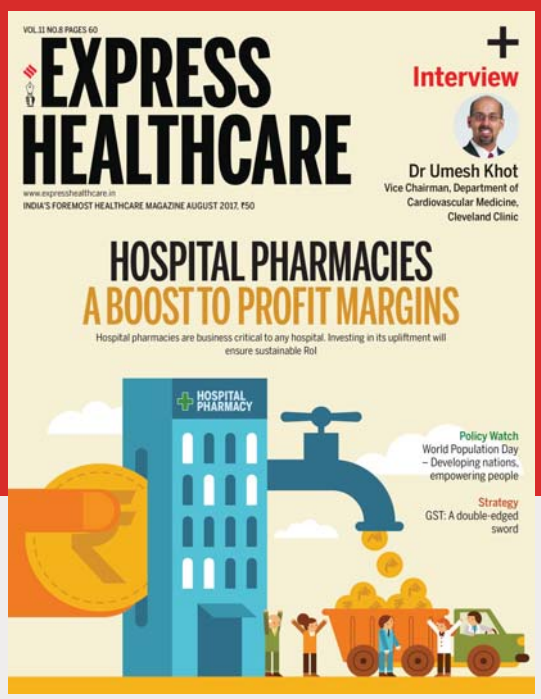
Dr Vidur Mahajan,
Associate Director, Mahajan Imaging, Head (R&D), CARING

> Radiologists should start adopting AI in their practice and use it as a tool to be better for patients – being replaced or not a thing of the future, and when it happens, we wont even find out because there would always be something else to do

computers have the unique advantage of being able to 'see' what humans cannot, and our group has created two such algorithms – one where a PET image can be created from a CT image, and another with a Diffusion Weighted MR Image can be created from a T2w image. Lastly, many argue that patient communication and empathy are areas where humans (radiologists) would always be needed – to that I ask – what percentage of your day did you spend in front of people vs in front of a screen? Machines are getting good at communicating, and soon it is possible that your Alexa or Google Home might be more empathetic and compassionate that a doctor (or a radiologist) since it will know what mood you are in, and what to say so that your mood improves, all using deep learning and other algorithms in the background.

In summary, I would like to say three things. First, humans are very bad at predicting with exponential extrapolation of time. What that means is, that when we make a prediction, we make one with linear judgement, we are unable to fathom the effect that exponential increase in technology can have in our day to day life. Cell phones are a great example of this. Second, radiologists exist at the top of the 'cognitive food chain' – the work that they do is possibly the most complicated and difficult work. That implies that by the time AI catches up and 'replaces' radiologists, imagine what other professions would have been replaced – General Physicians? Oncologists? Surgeons? Architects? Engineers? Software Developers? Drivers? And so on. So in a nutshell, radiologists should start adopting AI in their practice and use it as a tool to be better for patients – being replaced or not a thing of the future, and when it happens, we wont even find out because there would always be something else to do. And finally, you may notice that I have refrained from stating a timeline.

THE BOOSTER FOR THOSE WHO BOOST THE HEALTHCARE SECTOR



When it comes to nourishing this sector, experts prescribe a regular diet of Express Healthcare. The magazine has been the source of a healthy dose of expert information, incisive category analysis and remedies for industry ailments since 20 years, thereby earning the trust of industry professionals. It's no wonder then that the finest in the field trust the foremost in the field.

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NEWS

Cancer detection rate higher in breast MRI than mammography alone: Study

Breast MRI cancer detection rate being 10.8 per 1,000 examinations vs 8.2 for mammography alone

THE ADDITION of breast MRI to mammography in screening breast cancer survivors for new cancers results in higher cancer detection rates, but also more biopsies that are benign, according to a large study published in the journal Radiology.

Annual screening with surveillance mammography is recommended for the millions of breast cancer survivors in the US. A small but growing proportion of women who had breast cancer receive breast MRI as an adjunct to surveillance mammography, despite a lack of consensus among national clinical organisations over the practice. Evidence is limited on benefits and potential harms of breast MRI for breast cancer survivors.

"People often think more testing is better, that might be true for some women, but not necessarily all. It's important for clinicians and women to be aware of both the benefits and harms that can come from imaging," said lead author Karen J Wernli, an associate investigator, Kaiser Permanente Washington Health Research Institute, Seattle.

In the largest and most comprehensive study of its kind to date, Dr Wernli and colleagues compared the performance of breast MRI to mammography alone in 13,266 women aged 18 or older years who had survived breast cancer. Collectively, the women had received 34,938 mammograms and 2,506 breast MRI examinations from 2005-2012 to screen for second breast cancers. The data was drawn from five sites in the Breast Cancer Surveillance Consortium: the Carolina Mammography Registry, Kaiser Permanente Washington, the New Hampshire Mammography Network, the San Francisco Mammography Registry and the Vermont Breast Cancer Surveillance System.

Breast MRI had a slightly higher cancer detection rate than mammography alone. To achieve that higher rate, nearly twice as many women had to get breast biopsy, something that has been shown to heighten anxiety in women with prior breast cancer.

The breast MRI cancer detection rate was 10.8 per 1,000 examinations vs. 8.2 for mammography alone. The breast MRI biopsy rate was 10.1 per cent. The mammography biopsy rate was 4.0 per cent.

There were no significant differences between the two imaging modalities in sensitivity, or the ability to distinguish breast cancer from other findings. Rates of interval cancers, or cancers that emerged between screenings, were similar in the two groups, indicating that mammography did not miss more cancers that would become clinically detectable during the one-year surveillance interval.

In contrast to earlier studies of breast MRI performance, the researchers incorporated individual characteristics of women, such as education and income, into their analysis, along with treatment and primary cancer diagnosis. They found that the use of breast MRI was associated with younger age at diagnosis and use of chemotherapy, as well as higher education and income. The results underscore the complexity of decisions involving the introduction of new imaging tests into cancer screening programmes and support the importance of proceeding with caution, according to Dr Wernli.

"It's really important for us to know that when we're making guideline recommendations and conclusions that we really look at the best quality of the evidence. It's also very important to adjust for differences among women when we're trying to evaluate the addition of new imaging tests to surveillance mammography," added Dr Wernli.

2nd edition of Radiology and Imaging Conclave to be held in New Delhi from July 12-13, 2019

The theme of Radiology and Imaging Conclave 2019 will be Radiology 2024

AFTER THE success of the first edition of Radiology and Imaging Conclave in July 2018, *Express Healthcare* and the Radiology and Education Foundation (REF) is all set launch its second edition. The theme of Radiology and Imaging Conclave 2019 will be Radiology 2024, that delves into understanding future challenges and opportunities in the next five years. The conclave aims to disseminate information and knowledge that can help radiologists to turn challenges into opportunities and ensure a sustainable growth.

RADIOLOGY AND IMAGING CONCLAVE

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www.healthcaresenate.com/radiology/radiology.

Key topics that will be discussed are AI, CDS, women in radiology - entrepreneurship and leadership, devices as drugs - the fallout (good or bad) of radiology equipment coming under CDSCO, sustainability with responsibility, life cycle management of equipment, bare minimum practice takeaways (CDs, films, etc), Indian moonshots in radiology and what ails radiology education?

Visitor profiles include: Radiologists, Radiology centre owner, Promoters of imaging diagnostic centres and HOD of radiology dept in Hospitals and Medical colleges.

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BOOK REVIEW

Dr Kamal Mahawar takes the fight to fat

In his second book, *Fight with Fat*, bariatric surgeon **Dr Kamal Mahawar** take a good hard look at how culture, social norms, superstitions and apathy have made India the diabetes capital of the world. But more importantly, he also tell us what we can do to change this. An engaging self help book that hopefully empowers us with a better understanding of the disease

BY **VIVEKA ROYCHOWDHURY**

If UK-based bariatric surgeon Dr Kamal Mahawar's first book, *The Ethical Doctor*, examined healthcare delivery in India at the organisational level, his second one, *Fight With Fat*, aims to prod individuals to take on their flab.

And he is clearly well qualified to advice the obese on just how they can do this. As a consultant general and bariatric surgeon at UK's Sunderland Royal Hospital and a visiting professor at the University of Sunderland, he has seen the obesity epidemic from close quarters for over two decades.

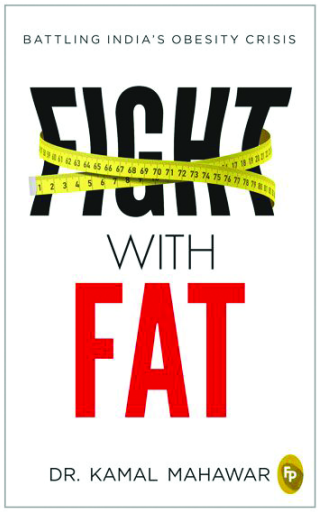
Priced at Rs 299, and available on Amazon, the book is written as a self-help book aimed at patients as well as doctors. The book covers much more than obesity, which is increasing its grip on patients worldwide. With India as the diabetes capital of the world, it is good that the book focusses on this country, analysing the social and cultural practices which earned us this dubious distinction. As the doctor author teases apart the social issues which juxtapose health, his apology in the preface prepares readers for some provocative remarks, which he explains as 'a deep-rooted sense of scientific detachment' needed to deal with life and death on a daily basis for the past two decades.

His first sentence of the first chapter calls to mind a stereotypical image of a 'Marwari businessman ...with a big belly' but before anyone can take offense, he explains that he comes from the clan! Thus readers can rest assured that his criticisms may sound harsh but are sympathetic, a shock tactic geared to jolt the reader into remedial action, now rather than later.

The author's frustration comes through clearly. Sample this sentence: The laws of modern health economics mean that people can no longer die without first transferring a substantial proportion of their wealth to the healthcare industry. (page 24). Conversational in tone, the book makes for a good read, with the scientific information decoded into layman terms ('think of your blood vessels as drain pipes': page 43). The witty insights and asides lift the book above the ordinary.

Divided into a dozen chapters, the book starts with the science (an explanation of the the epidemic of obesity, calling it a medical menace and the tip of the iceberg), moves on how patients can understand concepts like calories, hunger and satiety, healthy eating. Readers can pick up useful tips on healthy eating and cooking, lifestyle modification and physical activity. The growing incidence of childhood obesity gets a chapter as does obesity pills and bariatric surgery. He devotes yet another chapter to the role of the government and the last to the future. For the nerdy reader, the appendix has detailed formulae to calculate important obesity related data. Every chapter ends with takeaway points summarising the highlights for the lazy readers.

Most importantly, the book is a myth buster. He is well ware that his target reader, a caregiver or a patient, has access to all the (mis) information in the word at his fingertips, from Dr Google, Mr Wikipedia and numerous health so called health blogs etc. In India, we have our extended family and friends who helpfully pitch in with their 'advice'. The result is pure chaos which often leads to wrong decisions.



There have been numerous books written on this topic, each with their own merits, but this one written by a doctor who has seen the ravages of obesity scores high on credibility. The technical never interferes with the underlying message that patients need to take their health into their own hands. Obesity is preventable and the underlying message of this book seems to be that individuals ought to take responsibility for their actions and their lives.

Healthy eating tips range from not eating till we are full, the need to watch liquid calories in our *chai*, cutting down on the accompanying snacks, switching from bad carbs (sweets, sugary drinks even fruit juices) to good carbs (rice, roti, vegetables like potatoes and fruits like apples and bananas). Most of this is common knowledge but knowing is not the same as doing and the book serves up sound reasoning to nudge our choices to be more healthy.

The author joins the dots between childhood obesity and the role of school principals in the fight against the obesity epidemic, and in fact suggests that schools should be measured on the fitness of their students, rather than just how many of their students bag a medical or engineering seat. This would truly be radical but let's face it, we're not going to see it any day soon.

The author also discusses why Indians with even the so-called normal BMI are not safe from diabetes, high blood pressure or even coronary heart disease. Thus he warns against a false sense of security around weight and BMI as this is no indicator of fitness.

The chapter on healthy cooking urges us to re-think our traditional ways of cooking, suggesting for instance that instead of frying spices in oil, a better option would be to mix the spice with the tomato puree base and cook with as little or no oil. Other suggestions range from air frying samosas to increasing the intake of raw food like salads.

Interventions like obesity pills, bariatric surgery, liposuction as well as diets do make their appearance in the book, but the author does not hide their risks and stresses that developing healthy eating habits would be more sustainable in the long run.

He is particularly scathing when it comes to the role of the government, commenting that we can no longer blame our colonial masters for our low ranking on the human development index. He then turns the mirror on us, implying that we deserve the politicians (and policy makers) we get if we choose to focus on safeguarding cows rather than health or education. He comes down equally hard on superstitious practices and customs and hope his recommendations on school education, regulation of fast food outlets, food labelling, subsidising good food like fruits reach the right ears. Similarly, he concedes that a few schools and workplaces do provide healthy options but these are still in the minority.

Other suggestions like building a cadre of general practitioners and creating a modern system of primary healthcare centres which would be staffed by this cadre, are as long term as the others and are not totally new. In fact in his last chapter, focussing on the future, he comes back to the individual and stresses that health is first and foremost an individual's own responsibility, much before school, employers, the food industry, government etc. He admits that as a doctor, he has a limited role and few answers as an individual. But I can confirm that he has asked pertinent questions which deserve our attention. And action, at an individual level to start with.

viveka.r@expressindia.com

Carestream releases ImageView Software for its DRX-Revolution mobile X-ray system

New software offers advanced features, enhanced workflow and improved security

Carestream introduced introduced its ImageView Software Platform for its CARESTREAM DRX-Revolution Mobile X-ray System. The software is designed to offer advanced features and optimised workflow and uses a Microsoft Windows 10 operating system to deliver enhanced security. ImageViewsoftware was first introduced with the CARESTREAM OnSight 3D Extremity Imaging System and will be further expanded across Carestream's entire portfolio, including rooms, retrofits and additional mobile imaging X-ray systems in the future.

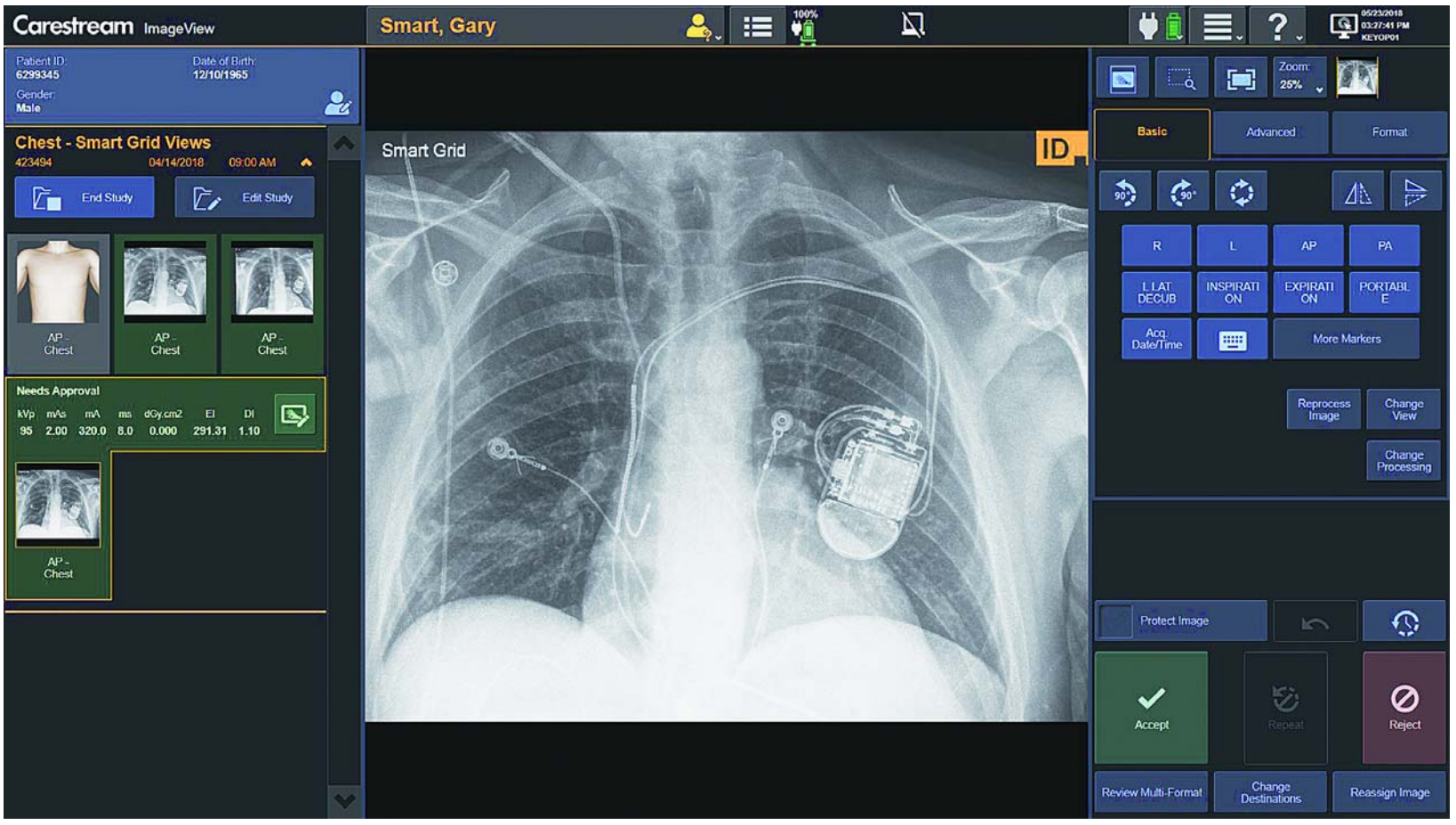
"ImageViewsoftware delivers an intuitive interface and consolidated screen views to boost productivity as well as new capabilities that can improve both workflow and security," said Jill Hamman, Worldwide Marketing Manager for Global X-ray Solutions, Carestream. "This software uses Eclipse, our advance dimage processing engine, to deliver exceptional image quality and enhanced diagnostic confidence, while providing a foundation for new applications in the future."

> The software is designed to offer advanced features and optimised workflow and uses a Microsoft Windows 10 operating system to deliver enhanced security

The software platform supports image processing and workflow capabilities including:

- Enhanced Visualisation Processing Plus software that delivers multi-band frequency processing to provide better noise control, sharpness, contrast and density while minimising artifacts
- Tube and line visualisation that uses a companion image created from the original exposure with optimised processing for clearer, easier visualisation of PICC lines and tubes to help increase confidence that tubes and lines are placed correctly
- Pneumothorax Visualization that uses a companion image created from the original exposure to accentuate the appearance of free air in the chest cavity
- Bone suppression software that uses a companion image created from the original exposure to reduce the appearance of bone and enable better visualisation of soft tissue
- Pediatric Image Optimisation and Enhancement software that acquires default acquisition techniques and image processing parameters optimised specifically for each patient's body size, from the smallest neonatal patient to the largest adolescent
- SmartGrid software that provides image quality comparable to images acquired with an anti-scatter grid and offers reduced patient dose for bedside chest imaging; and
- Access to RIS and PACS platforms that streamlines exam completion for increased productivity.

ImageView software also provides the ability to manage an imaging department's productivity and quality. The Administrative Analysis and Reporting option can help improve performance with a digital dashboard that allows users to track average exposure rates by technologist, rejected images with reasons and other statistics including detector drops. The Total Quality Tool package provides objective quality control image tests and collection of detector performance data.



CUBE 2019 symposium co-creates academic ecosystem to improve diagnostic prowess for empowering modern medicine

The event brought to fore the need for academic excellence to empower diagnostic health

FOLLOWING THE phenomenal success of CUBE 2018 in Mumbai, the next generation CUBE 2019 hosted in Mumbai got an overwhelming response as the event was value added with more scientific content, presentations, case studies, discussions and a much grander venue.

Aimed at revisiting the fascinating world of virtual microscopy and looking beyond just numbers in a complete blood count (CBC), CUBE 2019 haematology symposium was organised by Mindray in collaboration with BLK Hospital, New Delhi in Mumbai between April 20-21, 2019.

Cytomorphometery Unveiling Blood Evaluation (CUBE) focussed on relevant areas like automated red cell morphology, recent advances in automated leucocyte morphology, platelet cytometry – the old and the new, parasite identification and cellular interferences, virtual microscopy and digital imaging, counting beyond numbers, accreditation specific criteria (NABL 112) and haematology, middleware development and optimisation of haematology automation and beyond.

Over 200 delegates across India participated in this symposium. Maharashtra Medical Council (MMC) granted three continuing medical education (CME) credit points for delegates attending CUBE 2019.

CUBE 2019 Event went live on Mindray's social media platforms like YouTube, Facebook and Twitter. We had more than 2000 visitors using this live feed feature to get latest updates in the field of haematology via CUBE. Over 40 scientific sessions and case study topics were discussed in this two- day event.

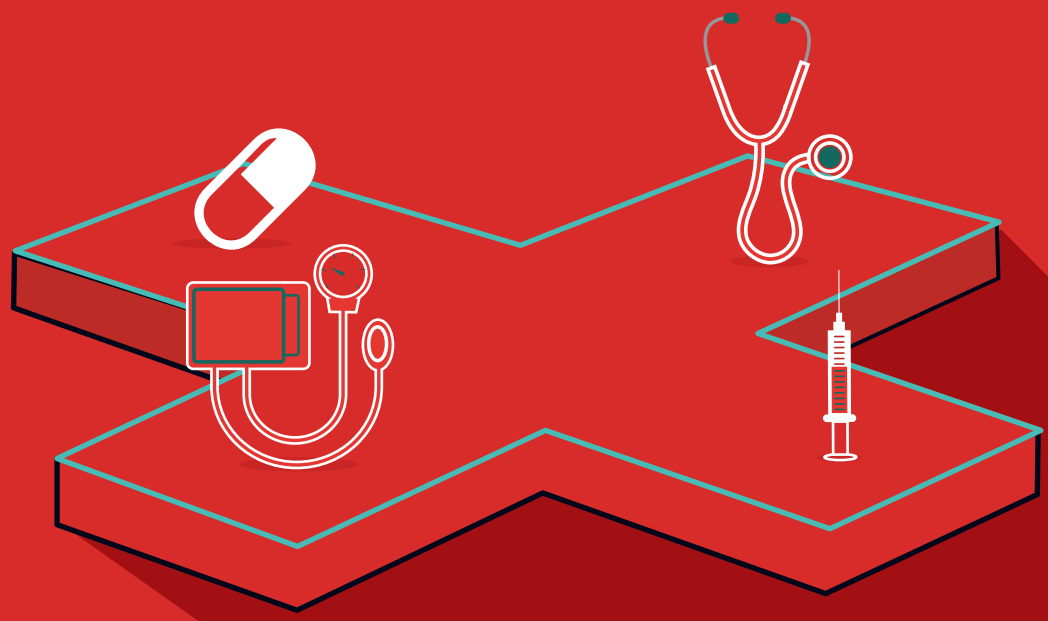
The extent and level of support that CUBE 2019 received was unprecedented and it demonstrated the increasing understanding and importance in taking forward this theme.

Mindray extended deepest thanks to all the participants that have wholeheartedly participated in the sessions, panel discussions and provided technical support on various aspects of the conference. Leading diagnostics dignitaries and practitioners who shared their invaluable experience and knowledge, and engaged in challenging discussions.

Event acted as a catalyst for setting the diagnostics health agenda in the country and provided an excellent forum for formal and informal discussion besides networking with industry leaders.

Mindray has carved a niche for itself in terms of latest innovations in all key business lines, namely patient monitoring and life support, in-vitro diagnostics and medical imaging system. While improving the quality of care, the company helps in reducing its cost, making it more accessible to a larger part of people with its products and services in healthcare facilities across over 190 countries and regions.

The event covered relevant topics like Cell Counters and MDS, PLT's in cardio vascular diseases, Thrombocytopenia in PICU, evaluation of platelet parameters in sepsis, platelet recovery in dengue fever and Image Morphometery - A Distinctive Approach, significance of NLR and PLR in BMT cases, digital morphology, automated slide making and integration advantages, standardisation of work-flow along with quality and screening algorithm for WBC pathologies using middle link software among others.



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When it comes to nourishing this sector, experts prescribe a regular diet of Express Healthcare. The magazine has been the source of a healthy dose of expert information, incisive category analysis and remedies for industry ailments since 20 years, thereby earning the trust of industry professionals. It's no wonder then that the finest in the field trust the foremost in the field.

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Fujifilm REiLI artificial intelligence review

Vivek Saxena, National Manager, Healthcare IT, Fujifilm India, talks about how the newly developed AI solutions meet the real needs of Fujifilm's global customers

The technological heritage of Fujifilm

Fujifilm has been working with images for over 80 years. Synapse 3D and PACS products of the Medical Informatics line can count on more than seventy technologies and 50 functional modules for Image Processing, continuously growing. At Fujifilm, we are continually innovating, creating new technologies, products and services that inspire and excite people everywhere: our goal is to increase the potential and broaden the horizons of tomorrow's businesses and lifestyles.

Through this powerful technological heritage, we quickly and easily develop new solutions that meet the real needs of our global customers: REiLI is the new Fujifilm Artificial Intelligence platform.

REiLI, which in Japanese means 'intelligent and resourceful,' represents a new frontier in diagnostics and will improve medical care thanks to the collaboration between health professionals and AI. The union of the technologies of Image Processing and AI will allow to obtain an even more accurate diagnosis.

How do we imagine this innovation?

The merger of REiLI with PACS will support the workflow of diagnostic imaging by leveraging the combination of AI technology deep learning and our image processing assets.

This synergy is based on three cornerstones:

- Region Segmentation: Identification of the position, form and name of the organ. Fujifilm is developing a technology that segmentation and accurately and consistently extracts the organ region regardless of differences in shape, presence or absence of disease and image conditions.
- CAD technology will use AI to identify suspicious lesions or diseases occurring within the image and add quantitative numerical values. Fujifilm is developing a technology to reduce the time of the image interpretation procedure and thus support the clinical decision-making process of the radiologist.
- Workflow support: When images arrive at the PACS, REiLI reads them and, if through the Region Segmentation and the CAD, detects any anomalies, it can intervene in the radiological workflow through:

a. An automatic notification in the integrated chat in the PACS

b. A modification of the examination priority in the PACS worklist

c. The automatic population of the report

Synapse 5 and REiLI

REiLI finds the perfect synergy with the Fujifilm PACS Synapse 5: the server-side-rendering technology and the centralised processing of Synapse 5 allow the easy application of the AI technology within the normal workflow management tool to support of health professionals.

This is where our revolution in Medical Imaging starts with the AI technology of REiLI.

Stay healthy with smart diabetic-friendly technology from Taiwan

ProtectLife develops safe and convenient clinical testing system that can detect diabetes

DIABETES IS rapidly gaining the status of an epidemic of the 21st century. According to WHO, approximately 72 million Indians have diabetes. The number is expected to double up by 2025. Across the world, the prevalence of the chronic disease is increasing at an alarming rate. The International Diabetes Federation states that about 7 million cases of diabetes are reported each year, worldwide.

Health care professionals assert that major cause of the non-communicable disease is sedentary lifestyle, erratic work schedules, and stress. In many cases, family history of diabetes is a risk factor. Unhealthy eating habits, lack of exercise lead to obesity, a major cause of diabetes.

Diabetes is a very complex health condition that affects the entire body. Generally, adults in their 50s and 60s are more likely to get affected. Nowadays, the prevalence among children and adults is increasing.

People suffering from diabetes are unable to maintain healthy levels of blood glucose or blood sugar in the body. Our body gets glucose from the food we eat. It is the main source of energy to our body.

Insulin, a hormone produced by pancreas help convert the sugars from food into energy needed by our body for daily functions. If our body does not produce enough insulin then the sugars in the blood do not get converted into energy and reach

every cell of the body. The sugars stay in the blood and do not reach the cells.

High blood sugar can cause serious health complications. Uncontrolled blood sugar can severely damage the blood vessels in the body and cause fatal health problems.

Key to controlling and managing diabetes is detecting at a pre-diabetic or an early stage. The Taiwanese brand ProtectLife has developed a safe and convenient clinical testing system that can detect diabetes accurately at an early stage. It has received this year's Taiwan Excellence award for innovation and quality.

ProtectLife's technology is a spectrum-based multi-analyte detection platform designed to enable *9quick, easy and simultaneous monitoring of biomarkers in a micro-sample. Combination of multi-test reagent discs, such as the complications of diabetes panel, renal panel, liver panel, cardiovascular panel, comprehensive metabolic panel and Albumin/Creatinine Ratio (ACR) urine test, the analyser is capable of testing up to 10 markers in one time.

With a small volume blood requirement, rapid analysis capability and easy operation convenience, the analyser is suitable for the designated point-of-care locations, such as clinics, care centres, a nursing home, ambulance, community health centres, schools, corporate health centres, remote areas, medical and clinical laboratory and other applications.

Once a person is detected with diabetes, he must consume healthy food, take medications regularly and exercise to stay fit. Exercising helps lowering blood pressure, reducing cholesterol, preventing weight gain, keeping heart healthy and increasing the body's sensitivity to insulin. It also helps in the long run to prevent fatal health complications arising from the disease.

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